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EDITORIAL



THE AMATEUR ASPECT

Two years ago Austin Forsyth, G6FO, Editor of British publication "The Short Wave Magazine", wrote an editorial under the heading of "Justification" which today, means even more than it did at the time it was written, for it sums up a situation existing in this country as well as in many others. Mr. Forsyth says:

"Proceeding from the basic assumption that the ether is free for all to use subject to reasonable safeguards reached by mutual agreement—a principle which needs constantly re-emphasising—we should now look at the conditions under which Amateurs are at present operating. Briefly, on virtually all bands except ten metres, they are 'working in the cracks'. That is to say, our rightful allocations are being trespassed upon by illegal commercial stations, to say nothing of noises emanating apparently from idling jammer transmitters. Though these encroachments have been increasing steadily and the whole situation gets progressively worse, it is nevertheless being met in the sense that more and more Amateurs are coming on the air and a great deal of DX is being worked, world-wide, on both c.w. and phone.

"What this means is that Amateurs are quite capable of working under shared-band conditions, if they must. But it also implies that a shared band means sharing—in other words, commercials have no ground for complaint if they are being interfered with by Amateurs. Nor does it necessarily follow, if a complaint is made, that in all circumstances a commercial station's operations are

more important than the Amateurs'. It could be shown that a great many commercials waste ether space and spend many hours transmitting merely to 'hold the channel'. In any case, the apparent threat of Amateur interference on a shared band is more imaginary than real; the commercials competing with us (on our bands) are always much higher-powered and practically never use their own frequencies for reception.

"In the same way that Amateurs—as a body, the most experienced, capable and progressive communicators in the world—have long since ceased to expect their own frequencies to be clear of interference by other Amateur stations, so the commercial use of the spectrum as a whole must be worked out, geographically and in time, to allow one channel to serve as many interests and services as possible.

"The present level of Amateur activity, with the high state of development of the art of Amateur Radio, has become its own justification for a proper share of the ether. This is not a matter of 'privilege', or even a 'right' (in the moral sense), but simply a requirement by virtue of sheer weight of numbers! Moreover, since radio amateurs are primarily concerned with and interested in Communication, they must have frequency areas available which are capable of carrying their DX traffic—that is to say, any suggestion that h.f. bands lost by further allocations in the deserts of the UHM or SHF is completely unacceptable."

FEDERAL EXECUTIVE.

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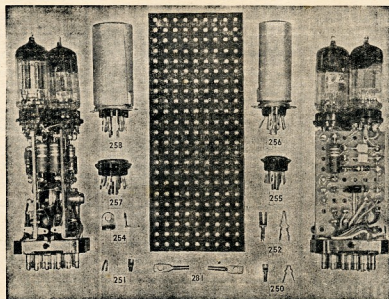
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Two Tubes and Crystal Control on 288 Mc.

RICHARD J. HEIGHWAY,* VK3ABK/T

AT a recent Zone Convention considerable interest was shown in a two-tube crystal controlled transmitter for the 288 Mc. band. As others may care to try this simple and inexpensive method of producing a low-power signal for portable or mobile use, the transmitter is described below.

The circuit (Fig. 1) uses a 6J6 third overtone oscillator and quadrupler, followed by a 6J6 push-pull tripler as the modulated stage.

Overtone oscillators and modulated tripler stages will no doubt be frowned upon by some, but with reasonable care, and a generous voltage supply they both work well in portable equipment.

The oscillator uses a capacitive voltage divider feedback system which is easily adjusted, by means of a variable capacitor, providing a convenient feedback control.

A crystal in the appropriate 8 Mc. range is used here, although others, in particular those especially cut for higher overtone frequencies, could be used with a suitable change in the multiplication factor in the first 6J6.

The anode circuit of the oscillator is resonated at 24 Mc. by means of a slugged coil, and is capacitively coupled to the second half of the tube tuned as a quadrupler, giving output on 96 Mc.

the welfare of the tube, the resistor in the anode supply can be changed. This resistor is bypassed for audio to prevent reduction in modulation depth.

The transmitter, built on a 4½" x 2½" chassis with a 5½" high front panel is as easy to construct and far more reliable than the unstable modulated oscillator devices which have been used in the past. Although the output may be lower, it is more efficient and effective, since the energy is radiated in a normal communication bandwidth of say 10 kc. instead of a wasteful 2 Mc. or more.

With the unit described, contacts both local and inter-city from fixed and portable locations have been made, and as a mobile transmitter, the small size, low power drain and stability make it worth consideration.

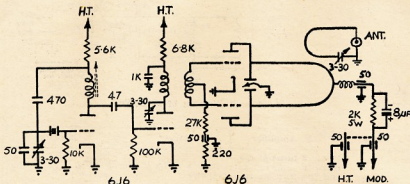
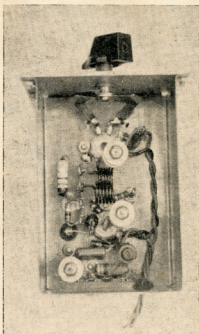
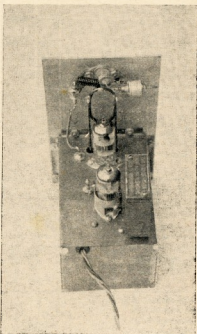


FIG. 1.



This underneath view shows the parts layout and mechanical details.

The output of this stage is fairly closely coupled to the grid circuit of the second 6J6, and provides 1.5 mA. grid current through the 27K ohm grid resistor. The output circuit of the 6J6 consists of a loop of 14 gauge wire which passes from the anode pin lugs of the 6J6 socket, vertically through holes in the chassis and is anchored by a rigid choke made from 18 gauge enamelled copper, soldered to a ceramic bypass capacitor clamped to the front panel.

The anode tuning is adjusted by means of a butterfly capacitor cut from 0.010" brass; the fixed plates are soldered to the 6J6 anode pin connections, and the rotor is mounted on a cut-down potentiometer shaft and bearing, fixed to the front panel.

Provision is made either to supply direct high tension to the tripler when it is used as a driver for a QQE06/40 via a QQE02/5, or to supply modulated high tension from a 12AT7/5763 144 Mc. portable transmitter, simply by removing the tubes and pushing a wire into pin 1 connection of the 5763 socket.

A coupling loop and a series trimmer capacitor are supported by the antenna socket on the front panel.

When connected to a 280-300 volt high tension supply, the transmitter draws 40 mA., of which the tripler stage accounts for 22 mA. In the unit described, about 1 watt can be dissipated in a 6 volt 400 mA. lamp load, but depending upon individual regard for

TWENTY-ONE YEARS AGO

From page 25 of "Australasian Radio World," 10th June, 1939—

"Ultra High Frequency Section, Inaugural Meeting of N.S.W. Division, W.I.A.

"First meeting of the newly formed U.H.F. Section of the W.I.A., N.S.W. Division, was held at the Y.M.C.A., Pitt St., Sydney, on the evening of 1st June, 1939. At a recent Council meeting of the Division, Mr. Don B. Knock (VK2NO) was asked to accept the presidency of the proposed U.H.F. Section and the chair was taken by him on this evening.

"Attendance numbered twenty-two including licensed Amateurs and listeners . . ."

Watch "A.R." next issue for an article on the V.h.f. and T.v. Group of the N.S.W. Division.

*22 Leonard St., Belmont, Geelong, Vic.

A Turret Tuner Receiver Front-End

BRUCE HOLLAND,* VK2ZAD

HAVE you ever wished to own a receiver which would tune all bands, from 80 metres through to 6 or 5 metres, having good bandspread in the Amateur bands and also giving general coverage from 1 to 55 Mc., one which is not too difficult or too expensive to build? If so this article will appeal to you.

I must confess that this design is not original or that I had anything to do with the development of it, but as most of you will gather from my address I am a parson, and as they say that I only work one day a week, the task has fallen on me. Acknowledgment goes to Jack VK2ADT, Reg VK2ATS, Sid VK2APS and Keith VK2ZER who have all built this tuner before me and helped me in its development. I must say at the start that this is not a step by step constructional article, but a general outline of the design to help anyone who wishes to build one of these tuners.

The tuner consists of a three-stage front-end designed to work into a first intermediate frequency of approximately 3 Mc. The r.f. tuned circuits are mounted on rails of insulating material (perspex, canvas bakelite, etc.), 6" long by $\frac{1}{2}$ " wide by $\frac{3}{16}$ " or $\frac{1}{4}$ " thick (do not use lighter materials as they bend and so give erratic contact). Through these rails are fixed a number of screws (11) to which the coils and trimmers are mounted.

The rails in turn are mounted on two hexagon disks about 3" across flats (see Fig. 2) which are secured by means of a potentiometer bearing sweated to $\frac{1}{4}$ " diameter shaft 6" apart; in between are fixed two hexagon baffle plates spaced at 2" and 4" from one of the disks.

A number of spring contacts are mounted on an insulated strip which is fastened to the chassis of the unit in such a way that they (the contacts) connect to the active coils. The contacts should also be arranged in such a way so that there is a minimum of connecting lead to the tuning gang and valve sockets, etc.

The electrical circuit, which is given in Fig. 1, is straightforward and consists of a 6AK5 pentode r.f. amplifier, a 6AK5 pentode mixer, and a 9001 pentode oscillator, operating from a 100 volt supply. The circuits are tuned with an ordinary three-gang b.c. condenser from which every second plate in the rotor and stator is removed, giving a capacity of approximately 100 pF per section. For bandspreading, a 20 pF mica condenser is connected in series with each gang section, while general coverage is obtained by shorting out the series condensers with a leaf type switch mounted on the gang.

The oscillator is set on the high side for 80, 40 and 20 metres and on the low frequency side on the other bands, the oscillator coils are all wound on formers except the 5 and 6 metre coils which are self-supporting. The r.f. amp. and mixer coils are only former-wound on 20, 40 and 80 metres.

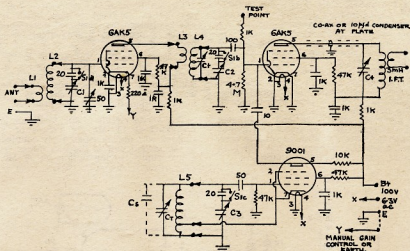


Fig. 1.—Circuit Diagram of Front-End.

Band	R.F. Amplifier	Mixer	Oscillator
5 mx	Prim.: 3 turns $\frac{1}{4}$ " dia., bellwire, between 1st and 2nd turns of secondary winding. Sec.: 4 turns 16g. $\frac{1}{4}$ " dia., 1" long.	Prim.: 4 turns $\frac{1}{2}$ " dia., bellwire. Sec.: Same as r.f. coil.	5 turns 16g. $\frac{1}{2}$ " dia., spaced 1". Tap 1 $\frac{1}{2}$ turns from earth end.
6 mx	Prim.: same as 5 mx coil. Sec.: 5 turns 16g. $\frac{1}{4}$ " dia., 1" long.	Prim.: Same as 5 mx coil. Sec.: Same as r.f. coil.	6 turns 16g. $\frac{1}{4}$ " dia., spaced 1". Tap 1 $\frac{1}{2}$ turns from earth end.
10 mx	Prim.: 3 turns bellwire, $\frac{3}{8}$ " dia., at bottom of secondary. Sec.: 9 turns $\frac{1}{4}$ " dia., 18g. E., spaced 1".	Prim.: 4 turns bellwire, $\frac{3}{8}$ " dia., at bottom of secondary. Sec.: Same as r.f. coil.	9 turns $\frac{3}{8}$ " dia., $\frac{1}{2}$ " long on former. Tap 3 turns. Shunt cap.: 35 pF.
15 mx	Prim.: 4 turns bellwire, $\frac{3}{8}$ " dia., interwound with sec. Sec.: 12 turns 18g. E. $\frac{3}{8}$ " dia., 1 $\frac{1}{2}$ " long.	Prim.: 5 turns bellwire, $\frac{3}{8}$ " dia., interwound with sec. Sec.: Same as r.f. coil.	11 turns 18g. E. $\frac{3}{8}$ " dia., 1" long. Tap 3 turns. Shunt cap.: 30 pF.
20 mx	Prim.: 11 turns 36g. E. over secondary. Sec.: 36 turns 20g. E. $\frac{3}{8}$ " dia., former close wound (c.w.).	Prim.: 16 turns 36g. E. over secondary. Sec.: Same as r.f. coil.	30 turns 20g. E. $\frac{3}{8}$ " dia., close wound. Tap at 10 turns.
40 mx	Prim.: 11 turns 36g. E. over secondary. Sec.: 30 turns 36g. E. c.w., 7/16" dia., slug tuned.	Prim.: 18 turns 36g. E. over secondary. Sec.: Same as r.f. coil.	30 turns 36g. E. c.w., 7/16" dia. former, no slug. Tap at 10 turns.
80 mx	Prim.: 25 turns 36g. E. over secondary. Sec.: 75 turns 36g. E. c.w., $\frac{3}{8}$ " dia.	Prim.: 35 turns 36g. E. over secondary. Sec.: 75 turns 36g. E. c.w., $\frac{3}{8}$ " dia.	42 turns 36g. E. c.w., $\frac{3}{8}$ " dia. former. Tap at 13 turns.

Fig. 3.—Coil Data.

Note.—All coils below double lines are wound on formers.

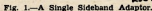
* The Vicarage, Railway St., Delungra, N.S.W.

STAN BOURKE,* VK2EL

* 17 Clisdell Ave., Canterbury, N.S.W.

The next section of the circuit may look a little unusual. We call these balanced modulators and I'm going to ask you to take my word for the fact that they do operate. P3 and P4 are adjusted to balance out the carrier and, provided that we have achieved amplitude balance and 90 degree shift in the r.f. and audio voltages, the result will be an s.s.b. signal. If this statement causes you sleepless nights, please write to the author for a more confusing explanation!

For class AB1 operation apply enough fixed negative bias to limit your "no signal" plate current to about half your rated plate dissipation, stabilise your



screen voltage and limit your drive to the region of zero grid current.

If you are now using a clamp tube with a pentode or tetrode final, you already have a "ZL linear" amplifier without alteration.

There are so many different types of transmitters in use that I will have to leave some of the design to you, but I will outline the set-up for a typical transmitter using the popular Gelofo v.f.o. driving one or two 807s or 6146s, as an example.

First, turn off your a.m. modulator and plug your microphone into the adaptor. Connect a short piece of co-ax to J1 and terminate it in a small link wound around the appropriate output coil in the v.f.o. Connect J2 to your final amp. grid circuit—use "C" if you don't have a tuned circuit there and "L" if you are using link coupling. Apply the fixed bias if you have settled for AB1 operation. For 807s, the bias value will be close to one tenth of your screen voltage—30 volts for 300, etc. For the 6146 the value will be near 45 volts. If you are using the clamp tube ZL linear circuit, check to see that the clamp tube is operating properly.

Band	Value for "CX" (two required)
80 metres	850 pF.
40 metres	450 pF.
20 metres	220 pF.
15 metres	150 pF.
10 metres	110 pF.

Fig. 2.

Tune L1 and L2 to resonance and you should have drive. If all is well you should find points near the centre of P3 and P4 where the drive (carrier) goes way down. Refer to the January 1960 issue of "A.R." and proceed to align your adaptor. (Leave out adjustments for L1 and L2.)

I don't propose to say much about the layout of the unit—you will probably want to match the size of your transmitter, or adapt it to the available space. Try to avoid any chance of power going from the driver to the p.a. direct whilst you are using the adaptor. Take a little care with the output of V4—it's a very high gain stage and we must get it and the final amp. absolutely stable. It seems like a good idea to enclose the adaptor in some kind of screening or shielding to keep it away from the field of the final amplifier.

The most troublesome problem you are likely to meet will be the v.f.o. stability, especially at 14 megs. and higher and the fact that you have to turn off the v.f.o. whilst listening. A more complete exciter, with features which overcome most of the limitations of this simple adaptor will appear in "A.R." in the near future.

NOTES

- 1 D. Pollard, 17 Clissell Ave., Canterbury, N.S.W.
- 2 Articles by N. Southwell, VK2ZF, in past issues of "A.R."
- 3 U.R.D., 175 Phillip St., Sydney. (Type AN34).
- 4 "Simple Sideband," L. A. Earnshaw, ZL-1AAX, "A.R." July '59, page 9.

A CHEAP 100 Kc. CALIBRATOR

R. L. BRENTWOOD,* VK3OP

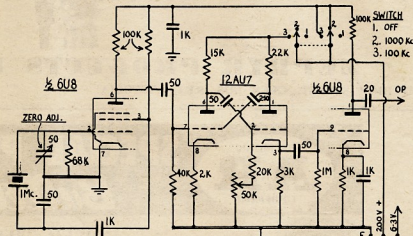
FOR some time at this station the need of an accurate frequency standard has been felt. However, 100 kc. crystals are expensive and hard to come by, so after some enquiries it was decided to use an accurate 1 Mc. crystal oscillator with a multivibrator circuit, to divide down to 100 kc. The scheme was completely successful, and as it is not described in the A.R.R.L. Handbook, and many Amateurs know very little of such circuits, the following information is passed along for what it is worth.

The system used here consists of the pentode section of a 6U8 as a crystal oscillator, which can be varied a few cycles either side of 1 Mc. by a 50 pF. trimmer. The signal from the oscillator is fed to one grid of a 12AU7 in a simple multivibrator circuit. The output frequency of this is determined by a 50K potentiometer. As no data was available as to component values in the

Then tune the transmitter v.f.o. or frequency meter to some multiple of 100 kc., but not of 1 Mc. (e.g. 3,600 kc.). Also tune a receiver to this frequency so the carrier is heard (without the b.f.o. on). Then with the crystal oscillator and multivibrator operating, slowly turn the 50K potentiometer, ignoring the "birdies", until a strong steady beat note is heard in the receiver. (This should not alter frequency when the receiver is detuned slightly.)

As a check, shift the v.f.o. and receiver by 100 kc., and a similar beat should be heard. If not, repeat the procedure on a different frequency, until a beat is heard at every 100 kc. interval.

As a final adjustment, zero-beat the crystal oscillator with WWV by altering the trimmer. It may be found that when the multivibrator is switched off the oscillator changes frequency very slightly, but this does not matter as the



Circuit of the 100 Kc. Generator.

All resistor values are in Ohms, and all capacitors in pF.

multivibrator, an experimental model was first built up and all values arrived at by cut and try methods. The circuit is not critical, and once adjusted will continue to work perfectly.

The layout is not important, as long as there is reasonable mechanical stability. Other valves have worked well, including a 6AU6 or a 6C4 triode in the oscillator, and a 6SN7 in the multivibrator position.

Altering the loading of the multivibrator will affect its operation, so it was found desirable to use the triode section of the 6U8 as an isolating stage. This may be omitted, but it is not advisable unless you want to be continually resetting the potentiometer. It was also found convenient to have a switch to remove h.t. from the multivibrator, so there is a choice of 1 Mc. and 100 kc. check points.

A method of aligning the unit is as follows. First check that the 1 Mc. oscillator is working and on frequency.

* 23 High St., Mont Albert, E.10, Vic.

1 Mc. check points need only be used for rough calibration, and then the multivibrator may be switched in for final adjustment.

As the use of crystal calibrators is well covered in the Handbook and elsewhere, no discussion of that will be entered into here. The unit described has been in operation for some weeks and no trouble has been encountered.

Power (6.3 volts at 0.75 amps., and about 200v. at 8 mA.) can be taken from a receiver, or alternatively the calibrator can be built into the receiver itself. A voltage regulator tube can be included but was not found necessary here.

The multivibrator produces usable harmonics up to 50 Mc. or more, so no additional harmonic generator is necessary; and if desired a further multivibrator could be added to produce signals every 100 kc. for extreme accuracy.

Finally, the unit needs a warm-up time of less than one minute for normal applications.

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"AMATEUR RADIO" MAGAZINE

FEEDBACK

"AMATEUR RADIO", the official journal of the W.I.A., is published by the VK3 Division who have delegated the work to an honorary Publications Committee. It is your magazine and so you have to contribute the articles which appear. This article is published so that you may appreciate the work entailed in printing "A.R." each month, and also so that your articles can be presented in such a manner that facilitates their publication.

All correspondence should be addressed to The Editor "A.R.," P.O. Box 36, East Melbourne, C.2, Victoria. This correspondence is studied by the Publications Committee who meet on the second Monday of the month. After this meeting all technical correspondence is acknowledged by the Secretary and other staff read the articles, and where required prepare drawings for publication. Some time may elapse before the article is published, due to space requirements for different items.

It is of great assistance if the articles are typed, with double spacing between lines. For preference use a paper size of 8" wide by 5 1/4" deep (half quarto). A one inch margin should be left all around the page. If you cannot type, then ruled paper could be used, but again please leave alternate lines blank and have the one inch margin all around. These requests help editing, proof reading, and above all make the printer's job far easier. Write on one side only, number each sheet and put your name and the title on each sheet as well.

"A.R." welcomes articles whether they be long or short, technical or personal, because we wish to make the magazine reflect your requirements. So do not hesitate to write, because unless we are told of Amateur activities, in turn, we cannot publish details. If your letter deals with an established column, e.g. V.h.f., S.w.l., DX, etc., then please write direct to the appropriate sub-editor.

Photographs of people, the rig, events, or of constructed apparatus are particularly requested and should preferably be glossy prints with good contrast. If they are large in size, so much the better, for this enables reduction in size when printed. All photographs will be returned if requested, so do not think you will lose a valuable print.

Sketches and circuit diagrams should be drawn on separate sheets of stiff white paper or tracing paper in Indian ink with the figure number, title and your name on the top. If you have draughting knowledge, or can get it done by a friend, this helps immensely.

The width is the important measurement. If the drawing will occupy one column in width, make your drawing 4 1/2" wide, as it will be reduced in production to half size. Two and three column drawings should be 9 1/2" and 14" wide respectively.

All lettering should be 3/16" high so that when the drawing is reduced the lettering is still readable, and keep said lettering within the confines of the drawing. Make all lines heavy to help reproduction.

However, if you cannot use Indian ink, then submit a clear legible layout which we can redraw before printing. It must be remembered that if work has to be done upon articles before they can be published, then further delays are incurred. So if you desire to see your article published in an early issue, please help by following the above suggestions.

As a guide to the amount of space your article will occupy, it is mentioned that four pages (size 8" x 5 1/4") of typed double spaced copy, with one inch margins all around, will fill approximately a full column printed in eight point type. If the smaller six point type is used, six and a half pages of copy will be needed to occupy a full column.

The Publications Committee asks all Amateurs to forward articles for publication, as the Australian Amateur is equally progressive as his overseas counterparts, but unless he publishes details of his work, there could be the impression that he does very little. The article you write need not be a long learned treatise because the smaller article is equally acceptable, and in fact is always required to fill in those spaces which appear in any magazine layout.

Many hours of work are required each month to ensure your magazine is ready upon time and despatched direct to you. However, instances do occur where the magazine does not arrive. This can be caused by a variety of reasons, but in every instance it is a wise precaution to check with your Division to see that the correct mailing instructions have been forwarded to "A.R." The Distribution Manager cannot alter any mailing address unless he receives advice from the Division concerned. So always check that your card has the correct details shown on it, and if it hasn't then request your Division to amend it accordingly. Then you can blame "A.R." or the postman if you don't receive your magazine.

Publishing the magazine is a task which has its rewards, but it is always of great assistance when the readers comment. This comment can be directed towards an article, an omission, or a suggestion for improvement; irrespective of what the comment is, it will be dealt with on its merits. So why not write today and comment, but remember that no publisher will print the text of unsigned letters.

The correspondence column, has during the past three months, carried some controversial subjects which, in turn, have aroused much comment. This is a good thing because people like having a "shot" at their fellow humans, and generally anything which makes people think achieves some end result. So if you have ideas, why not write to "A.R." because by so doing it gives every Amateur a chance to reply.

Remember that "A.R." is your magazine, and its success depends upon your co-operation. By co-operating, you help everyone, and this in turn helps the W.I.A. An active Institute, coupled with a good magazine, reflects the progress that Australia is making today.

We look forward to reading YOUR article in a future issue of "A.R."

A child's world is a wondrous thing wherein everything is fixed, and the possibility of change or alteration is beyond the realm of comprehension. It is a delightful period of time which we gradually lose as we grow older because adults realise that tomorrow will differ from today in so far as it may be better, or it may be less pleasant.

It occurs to me that the Australian Amateurs are living in a child's world. You may disagree, but how often have you heard your fellow Amateur talking as though things were permanent. A typical example is the last I.T.U. Conference. Because we did not suffer such severe frequency cuts as were expected, many Amateurs are now sitting back to enjoy their future. What future? The sole reason Amateurs did not lose more frequency allocations was the fact a major alteration to all frequency users was too complicated a task for this Conference. However, my opinion is that every frequency user commenced yesterday to prepare his own case for the forthcoming Conference. So that unless we now commence planning along the same lines, at the next I.T.U. Conference the world's Amateurs will be hard pressed to retain any frequency allocations.

A pessimistic view perhaps, but it is an adult approach, and not the thinking of children. If you wish to continue operating as an Amateur Radio Station in the future, then you must commence planning that future today! This is not conjecture, for the shadow of past I.T.U. Conferences points ominous fingers to the future trends and the need for frequency allocations to non-Amateur services.

Your reaction could well be "so what can I do?" To which there is a positive answer. It is your problem, for you must see that your Division commences today to think about the matter and forms a plan for presentation to Federal Executive. In turn they must consolidate all plans and prepare a master plan. Under no circumstances must we permit the past efforts made on our behalf by John Moyle to become solely historical. Nor must we forget that John Moyle acted upon a plan prepared by Federal Executive of the W.I.A.

The past history of many peoples proves that decadence follows complacency, and that resting upon past efforts leads to stagnation. Every Amateur must today ensure that our plan has commenced and from then onwards follow up to see that it is an active progressive idea. Tomorrow is too late, for by then we could well find that we no longer possess any frequency allocated to Amateur Services. Act today!

Until the Australian Amateur has established his permanent rights to specific frequency allocations he should adopt the motto of the three P's—

PROGRESS
PUBLIC RELATIONS
PUBLICITY

and from then onwards double his efforts towards more progress.

THE G4ZU "BIRD CAGE" AERIAL*

DICK BIRD, G4ZU

THIS project started in 1957, the object being to discover some simple structure which would give a power gain of up to 10 db. in the 20 metre and possibly the 40 metre bands.

A five-element wide-spaced Yagi can provide such a performance, but requires a boom length of at least 57 ft. on 20 metres and over 110 ft. on 40 metres. In the hope of achieving a reduction in physical size, tests were conducted with inductively loaded elements, but when an attempt was made to use more than three elements the gain did not increase according to the book. It was found that even the best loading-coils have an effective r.f. resistance of at least 20 ohms.

Although the feed impedance of a loaded beam may seem to be around 45 ohms, and although the measured s.w.r. with a 52 ohm feeder appears satisfactory, the unpleasant truth is really as follows.

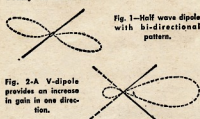


Fig. 1—Half wave dipole with bi-directional pattern.

Fig. 2—A V-dipole provides an increase in gain in one direction.



The 45 ohm impedance at the feed point is made up of two components, the 20 ohm loss resistance in the coils plus the 25 ohm radiation resistance of the beam itself. In other words, only half the transmitter power is radiated. The rest goes to waste in the form of heat. These figures refer to measurements on a typical wide-spaced three-element array.

With closer spacing, and more elements, the position becomes even worse! A five-element array has a radiation resistance of less than 10 ohms. With 20 ohms loss resistance more than two-thirds of the transmitter power is wasted. There seemed little hope of achieving the power gain desired by such methods.

Tests were then made on loop type elements, e.g. the Bruce, Bi-square and simple Quad. When used with a second element of similar type, suitably phased, such configurations are capable of quite appreciable power gain. Ten db. gain would probably be a rather optimistic estimate, but 8½ db. gain can be realised without much difficulty. There is, however, the disadvantage that the adjustment which provides maximum back-to-front ratio, does not coincide with that for maximum gain.

A double loop array also poses numerous mechanical and structural problems. Bamboo rods or wire are all very well for a temporary lashup, but the appearance could hardly be called professional!

● A new array giving high gain in limited space. It is similar in some respects to a cubical quad but it has a much improved mechanical structure, higher gain, and facilities for multiband operation without using interlaced elements.

The problems to be solved seemed to fall under the following main headings:

1. To devise an entirely new mechanical structure and so position the elements in space as to achieve a sound and clean looking engineering job.

2. To endeavour to arrange that the tuning positions for maximum gain and maximum front-to-back ratio are as far as possible coincident.

3. To find some means for providing additional gain with the object of attaining an overall figure of 10 db.

4. To flatten the somewhat sharp tuning and increase the bandwidth by using tubular elements of a reasonable diameter and at the same time to eliminate wood or insulators at high voltage points as these cause serious loss in wet weather.

5. To make provision, if possible, for multiband operation without using interlaced elements.

Keeping all these points in mind, it seemed that the best approach would be to build up an entirely new structure in space starting from first principles, and giving special consideration to item 3—increased gain.

The diagrams show how the array began to take shape. Fig. 1 is an ordinary half-wave dipole with a bi-directional pattern. Fig. 2 shows a "V" dipole. Such an arrangement, when used with a reflector of similar construction, gives considerable power gain and the front-to-back ratio greatly exceeds that which can be obtained with a normal two-element array.

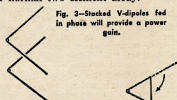


Fig. 3—Stacked V-dipoles fed in phase will provide a power gain.

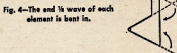


Fig. 4—The end ½ wave of each element is bent in.

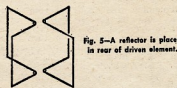


Fig. 5—A reflector is placed in rear of driven element.

Fig. 3 shows two "V" dipoles stacked vertically and fed in phase so as to provide additional power gain. Fig. 4 shows the end eighth-wave of each element bent inwards until they meet. Power can now be fed to the closed loop at a single point either at the top or at the bottom. The next move is to put a similar structure, operating as a reflector, back-to-back with the first (Fig. 5).

CONSTRUCTION

Coming now to the actual physical construction, Fig. 6 shows one possible approach. Eight radial elements, each only one-eighth wavelength long, are arranged symmetrically in two stacked bays around a vertical mast. These elements can conveniently be made of ordinary dural tubing. To maintain a correct phase relationship between the two bays, the tips of the elements are joined together with vertical wires approximately one-quarter wavelength long. This, incidentally, helps to brace the elements against vibration, and ensures a very low wind resistance.

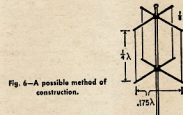


Fig. 6—A possible method of construction.

It will be immediately apparent that such an arrangement is much more attractive from a structural point of view than the normal cubical quad. (Figs. 7A and 7B.) Due to the "V" dipole effect, the power gain is also 1-1½ db. better. Further, it was found that, quite by chance, the side lobes with this type of arrangement are practically non-existent and the adjustment for maximum gain coincides very closely with the adjustment for maximum front-to-back ratio.

It will be seen that the spread of the array and the spacing between the vertical wires is approximately 0.175 of a wavelength, so that it can rotate in a circle of 8 ft. radius. With such a spacing, the feed impedance comes out to quite a convenient figure of 40/50 ohms, depending upon tuning and height above ground.

The general performance was so promising that in Feb. 1958 a Patent Application was filed under serial 4063/58. A number of additional developments were then completed, to give more flexible methods of feed and to provide multi-band operation, and these improvements were incorporated in a further Patent Application filed in Jan. 1959 under serial 187. Some of these modifications are shown in Figs. 8, 9, and 10. Fig. 10 in particular should prove attractive to those with limited space as it is effective not only

on 20 metres, but also on 40 metres, with a turning circle radius of 8 ft.!

The stub which in the drawing is shown flapping in the breeze would, of course in actual use, be passed down inside the tubular mast.

SINGLE BAND OPERATION

For those who are only interested in single band operation, Fig. 11 shows another interesting arrangement. The height of the array is increased to just over one-quarter wavelength so as to be resonant outside the low end of the band. The series condenser on the reflector loop then permits precise adjustment for maximum gain at any point in the band. The series condenser on the radiator feed provides adjustment for the lowest possible standing-wave ratio in the feeder.



Fig. 7A (above).
Before erection.



Fig. 7B (left):
After erection,
with radial arm
disposed at right
angles.

Another approach would be as per Fig. 12. Tapping points on the radiator rods after the style of a T-match would permit selection of an impedance to suit anything from co-ax, to a 300 ohm or 600 ohm open wire line.

Credit must go to the little girl next door for christening the array. When tests were first being made on a scale model at 145 Mc. she asked if the thing on the pole was a "Bird Cage"? The label seems to have stuck and all things considered it is perhaps not inappropriate.

For the benefit of those who would like to give the Birdcage a try, dimensions are given in the appendix which should enable anyone to construct the single-band version without difficulty. The dimensions are for 20 metres, but can, of course, be re-scaled for other bands.

TECHNICAL APPENDIX AND CONSTRUCTIONAL DETAILS

For 20 metres:—

Horizontal elements: All one-eighth wave long, 8 ft.-8 in. 8 in.

Vertical wires: All one-quarter wave, 17 ft. approx.

Precise length of vertical wires can be adjusted for resonance and lowest s.w.r. at the desired frequency, or the series condenser method of Fig. 11 can be used.

The reflector should be tuned for maximum F/B ratio. The easiest way of doing this is terminate the lower end of the reflector loop in an open wire stub and slide a shorting bar along the stub for minimum radiation off the back. This setting will be very close to the adjustment for maximum gain.

The eight radial rods can be supported by blocks of insulating material or ordinary hardwood dipped in wax. The r.f. potential is low and no leakage problems will be encountered.

Total distance round radiator loop is approximately one wavelength or $2 \times (495 \div f)$.

Reflector loop is 5% longer due to extra wire in the stub.

It is an advantage when using co-ax. cable to feed the radiator loop at the top, taking the feeder up inside the quarter wave vertical mast. This gives perfect Balun Action thus avoiding loss or pattern distortion due to feeder radiation, and is much more satisfactory than so called gamma matches which are critical in adjustment and likely to introduce power losses.

Radiation is entirely horizontally polarised. There is a phase reversal at



Fig. 8—Vertical wires extended to brace the radial elements.

Fig. 9—Two loops at right is another form of birdcage.



Fig. 10—This construction is ideal for 10 and 20. The stub may be inserted in the mast.

Fig. 11—This single band job uses a condenser to tune the reflector for maximum gain. The condenser in the radiator is tuned for minimum s.w.r.



Fig. 12—Tapping points along the radiators permits selection of impedance from 50 to 600 ohms.

the centre of each vertical wire with zero current flowing. The vertical wires fulfill the same function as the vertical wires in a Zebra or Lazy H and are used solely to provide correct phasing between the upper and lower bays.

The X construction brings the current loops in close proximity, giving power transfer to the parasitic element more efficiently than with a Quad or two-element Yagi. The performance closely approaches that of an all-driver array.

The main advantages over a cubical quad are as follows:—

- (1) No horizontal boom to distort the pattern or absorb energy.
- (2) No insulators at high voltage points to introduce loss.
- (3) Tubing is used in place of wire for the parts of the array carrying maximum current, i.e. less resistive loss.
- (4) Perfect balun action due to the quarter wave vertical mast. No matching to adjust—no line radiation.
- (5) The X type elements have higher Q than a quad loop. The gain is there improved. (See W6SAI Antenna Handbook.)
- (6) The X elements give better front-to-back ratio.
- (7) The mechanical advantages are self evident.
- (8) Extremely low angle of radiation when used at normal heights.

VK6 GRAND OLD MAN

"Skipper" Schofield, VK6WS, is the grand old man of VK6. He is totally blind and will be 86 years old on July 18. He is on the air on 40 and 80, and is one of the most active VK6s on these bands.

"Skipper" got his call back in 1938 and up to three years ago was heard on 20, 40 and 80 metres. Then his eyesight failed and after a period realised that there was still much to be gained in Amateur Radio.

He is now looking forward to a special permit to operate on 10, 15, 20, 40 and 80 metres, using a Geloso transmitter.

Without doubt, VK6WS is a splendid example of what can be achieved in spite of the loss of his eyesight. A real inspiration to us all. Many happy returns OM.

TRADE PRESS RELEASE

Mr. R. H. Cunningham, Managing Director of R. H. Cunningham Pty. Ltd., National Television Engineering Pty. Ltd., and Panton (Australia) Pty. Ltd., will study the latest designs and manufacture of electronic components and equipment when he visits the United Kingdom and U.S.A. Mr. Cunningham left by air on June 5. While in London he will attend the Plessey International Convention.

V.H.F. NOTES

V.h.f. Correspondents are reminded that notes for this page must be in the hands of the sub-editor (Frank O'Dwyer, VK3OF) by the first day of each month. This will permit Frank to compile the V.h.f. Notes and be able to forward them to the magazine by the 8th of the month. It is regretted that the V.h.f. Notes for this issue had not arrived at time of going to press.

AMATEUR CALL SIGNS FOR MONTH OF MARCH, 1960

NEW CALL SIGNS

VK—
New South Wales
 2CB—G. A. Rutter, 21 Hall Rd., Hornsby.
 2ADJ—K. J. Fowle, 63 Bower St., Manly.
 2AJT—K. F. Pulling, 112 Great Western Highway, Lithgow.
 2ATA—P. A. Tavares, 18 Eric St., Artarmon.
 2AVT—G. L. Thompson, 122 Woniara Rd., Hurstville South.
 2ZPC—F. J. Carter, 3 Bell Place, Mt. Pritchard.
Victoria
 3ACS—K. C. Seddon, 7 Wilson St., Brighton, S.S.
 3AIA—R. C. Richards, 10 Alleyn Ave., Bon-
 beach.
 3ANL—Morwell High School, McDonald St.,
 Morwell.
 3AZZ—R. J. Gray, 18 York St., Reservoir.
 3ZHE—T. F. Brain, 14 Watson St., Preston.
 3ZHL—W. H. Erwin, 1 Kell's Ave., Herne Hill,
 Geelong.

Queensland
 4CC—C. J. Cooke, 79 Kuran St., Chermiside.
 4ZEH—E. R. F. Hardman, 32 Waterlot St.,
 Yeerongpilly.
 4ZGH—L. J. Horrocks, 98 Duke St., Annerley.
South Australia
 5AG—G. T. Allen, 29 Hume St., Salisbury Nth.
 5GG—G. A. Gormly, 40 Albert St., Edwards-
 town.
 5GR—H. E. A. Gehrke, 50 Barton St., Blair
 Creek.
 5ML—G. S. Coombe, 1 Everett St., Brooklyn
 Park.
 5PJ/T—J. K. Carter, 25 Shropshire Ave., Hill-
 crest.
 5PZ—Prince Alfred College Radio Club, De-
 quetteville Tce., Kent Town.
 5WY—J. F. Westley, Radium Hill.
 5ZGP—G. A. C. Pearson, 47 Clifton St., Pros-
 pect.

Western Australia
 6NR—N. Cooper, 60 Milford Way, Nollamara.
 6ZCJ—R. J. Carter, 135 Grand Promenade,
 Bedford Park.

Tasmania
 7ZAH—K. J. Henricks, 27 Victoria St., Ulver-
 stone.
Territory of Papua and New Guinea
 9BW—W. H. Holland, Station: Malaguna Rd.,
 Rabaul; Postal: P.O. Box 187, Rabaul.
 9ZJK—J. M. Kendall, Mount Hagen, Western
 Highlands.

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 2AS—A. C. Freeman, 38 Cheltenham Rd., Chel-
 tenham.
 2BA—B. A. Chapman, Warrimoo Rd., St. Ives.
 2TG—A. T. Goldie, Lot 2, Edith St., Bardwell
 Park.
 2ABM—R. G. Morgan, 98 Northcote Rd., Green-
 acre.
 2AJQ—C. C. Turner, 16 Sparkes Ave., Mort-
 dale.
 2ALN—L. E. Winton (Rev.), The Rectory, Kan-
 darah.
 2AXK—D. L. Kinsella, Christian Brothers In-
 termediate Technical High School, St. Joseph's,
 Newtown.
 2ZHH—J. W. Hutchinson, 18 Northcott Ave.,
 Wagga.

Victoria
 3IM—Q. N. Porter, 40 Fairfield Ave., Camber-
 well, E.S.
 3LP—G. Wibur, 35 Pearson St., Balmisale.
 3TC—L. M. Renshaw, 6 Merry St., Ringwood
 East.
 3ZO—N. L. Storck, 15 Victoria Rd., Northcote,
 N.18.
 3ALO—A. L. Lowe, 28 Ramsay Ave., East Kew,
 E.S.
 3AMO—M. S. Lang, 69 Bayview Cres., Black
 Rock, S.S.
 3CZC—M. R. Osborne, 4 Dundee St., Balwyn,
 E.S.
 3ZEI—G. W. Quirk, Station: MacMeikin St.,
 Whittlesea; Postal: P.O. Box 1, Whittle-
 sea.
 3ZGP—L. C. Fowler, 16 Bourne Rd., Glen Iris.
 3ZGV—R. D. Voight, 105 Wattle Valley Rd.,
 Camberwell.
 3ZHB—W. G. Higgins, 12 Vincent St., Sandring-
 ham, S.S.

**3ZJE—J. R. Edwards, 52 Orrong Rd., Eistern-
 wick.**
Queensland
 4DY—E. J. Wright, 35 Benbow St., Ekibin.
 4KE—R. L. Shilton, Dalziel St., Stratford,
 Cairns.
 4OM—M. N. O'Burtill, R.A.A.F. Married Quar-
 ters, Sidney St., West End, Townsville.
 4RJ—R. J. R. Debridge (Rev.), "Hi-Tor,"
 Tweed St., Burleigh Heads.
 4ZF—H. Z. Peters, Station: Mary River Rd.
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 Box No. 406, Mary River Rd., Cooroy.
 4ZGX—K. J. Benson, 47 Scarborough St., South-
 port.

South Australia
 5EW—W. R. Edwards, Station: Leichhardt Tce.
 Alice Springs; Postal: Box 21, Alice
 Springs, N.T.
 5FP—F. C. Purcell, 28 Rockville Ave., Daw
 Park.
 5OD—Open Door Radio Club, Methodist Par-
 sonage, Mt. Barker.

Tasmania
 7KC/T—L. Cordell, 88 Kaoota Rd., Rose Bay.

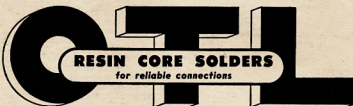
CANCELLED CALL SIGNS

VK—
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 2JUL—J. M. Moyle.
 2AUU—J. M. Moyle.
 2APU/T—J. K. Carter (now VK3PJ/T).
 2ZCB—E. Berlage.
Victoria
 3RG—J. H. Jones.
 3VH—L. W. Hoobin.
 3ADT—J. J. Mount.
 3ANR—N. Cooper (now VK6NR).

Queensland
 4HQ—W. H. Holland (now VK3BW).
South Australia
 5LI—W. B. Legg.
 5MB—H. M. Brown.
 5ZGA—G. A. Gormly (now VK3GG).

Tasmania
 7RG—R. Garth.
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VK6MX	43 240	VK4HR	12 192
VK5AB	45 232	VK3BZ	3 176
VK4JF	21 219	VK4RW	23 164
VK3WL	14 211	VK3EE	10 163
VK3ATN	26 204	VK6DB	31 161

Amendments

VK4DO	20 139
VK2AJQ	47 100
VK3JTG	48 101

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VK3CX	26 266	VK3XU	3 225
VK4JF	29 262	VK6RU	16 209
VK3PH	15 226	VK3YL	39 203
VK3NC	19 228	VK3EO	2 161
VK3BZ	6 222	VK3EE	23 165

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VK3RJ	42 164		
New Member			
VK3XU	64 129		

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VK4JF	32 266	VK3XU	48 213
VK6RU	8 263	VK3WL	45 225
VK6MX	74 245	VK3XU	61 221
VK4HR	7 233	VK6KW	13 214
VK3BZ	4 231	VK3EE	12 210

Amendments

VK4DO	15 196	VK3JT	63 150
New Member			
VK3XU	79 146		

Some Thoughts on V.F.O.'s.

JOHN ANDERSEN,* VK3ZF0

IT is the author's intention in this article to discuss some of the considerations of stable v.f.o. construction and some of the pitfalls and to give some indication as to how they can be avoided or ignored with impunity, concluding with a brief description of a v.f.o. constructed along these lines.

To have a good v.f.o. one must consider the following points:—

- ★ Note,
- ★ Electrical stability,
- ★ Mechanical stability,
- ★ Thermal stability.

Let us look at each of these in detail.

NOTE

A poor note is generally tied up with two things; either an inadequately filtered power supply, or interaction between filament and cathode. The first fault is easily overcome by more complete filtering, but the second requires more understanding.

A poor note will arise if the cathode has low heat and electron reserves. In oscillation the cathode will be depleted in electrons and thus cooled. If the heater cannot supply sufficient heat to maintain a constant temperature, then the cathode emission will vary in sympathy with the pulsating filament current (assuming a.c. heaters).

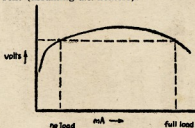


Fig. 1.

The obvious cure is to use a tube of high cathode capacity, which is why power tubes such as 6AG7's and 6CL6's are preferred. One tube often used in v.f.o.'s, but generally avoided like the plague by designers is the 6AC7. This tube has a massive cathode to enable its high gm. to be attained but suffers from low heater-cathode resistance. This can be overcome by using a separate filament winding and placing the filaments at about 25 to 50 volts above earth by a suitable divider network from the stabilised h.t. source. This eliminates heater to cathode emission by placing the heater above cathode potential, thus removing any direct effect of the heater on the cathode.

ELECTRICAL STABILITY

Providing reasonable care is taken, all the standard oscillator circuits with a fundamental frequency in the 2-10 Mc. region are capable of giving sufficient stability for work well into the

v.h.f. spectrum. Admittedly some circuits are inherently more stable than others and probably the simplest and least critical of adjustment is the Clapp circuit, but even this old faithful must be treated with respect if the v.f.o. is to be used for s.s.b. or for v.h.f. a.m.

This means silver mica capacitors and good ceramic insulation wherever possible, including the oscillator valve base, although this is not quite so important.

Good components do not cost very much when the total cost of the unit is considered. After the oscillator, anything goes within reason.

Note that ordinary mica capacitors are quite unsuitable. Although the insulation is good, they are thermally unstable and "creep," i.e. they change in value in jumps as the temperature changes, giving interesting effects on reception.

Another electrical effect is that of oscillator pulling. This is the change in frequency that results when the v.f.o. is loaded by the transmitter. Provided the v.f.o. power supply has adequate reserve, i.e. is fully stabilised, and that the v.f.o. output tube has sufficient electron reserves this effect should be negligible, even when multiplying into the 2 metre band.

MECHANICAL STABILITY

It is obvious that for high multiplication such as is required for v.h.f. v.f.o.'s, there can be no mechanical instability whatsoever. All wiring associated with frequency determining cir-

cuits must be rigid not only within itself but with respect to everything else such as chassis and surrounding components. Hence use heavy gauge wire well supported and make sure that all tie points are quite firm.

Ideally everything should be made massive. The variable capacitor ideally should be an N.P.O. type with double bearings but any good quality gang with no shaft movement will do. Even a b.c. gang can be used provided a silver mica series capacitor is used to pad it down to give the capacitive swing required.

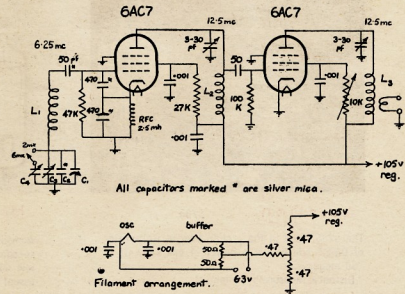
The coil should be wound on a good quality ceramic former with thick wire under tension. Tension winding gives a very rigid structure which helps with mechanical and thermal stability, while the thick wire, coupled with suitable coil dimensions, gives a high Q factor which leads to greater electrical stability.

THERMAL STABILITY

Here we must include humidity effects. Change in the water content varies the air dielectric constant which in turn varies both the coil inductance and distributed capacitance and the tuning capacitor value. There is little that can be done about the capacitor change, but the coil variation can be reduced by dipping in wax or a suitable resin.

This approach must be used with care as some waxes and resins are ex-

(Continued on Page 18)



All capacitors marked * are silver mica.

Fig. 2.

- L1—No. 11 Set osc. coil form full 24 s.w.g. wire, tension wound; about 2 ins. at 20 t.p.i., 3/4 in. diam.
- L2—1 in. long. 3/4 in. diam. 24 s.w.g. close wound.
- L3—As L2 with 5-turn link at h.t. end of coil.

- C1—Double bearing double spaced variable of ancient vintage with 4:1 gear reduction built in; 2 moving plates only.
- C2—About 100 pF, part of which can be N750.
- C3—Screw-driver adjustment min. variable trimmer, 2-50 pF, ex. A73.
- C4—3-30 pF. ceramic trimmers.

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SOME THOUGHTS ON V.F.O.'s.

(Continued from Page 13)

remely absorbent and can enhance the effect. Generally it is safer not to do any impregnating unless extreme stability is required, as in frequency measuring and monitoring.

If a zero temperature coefficient capacitor is not available then a large gang can be used suitably padded down as described above. This reduces the percentage temperature variation to a very small amount. Little can be done directly about correcting for temperature with the inductance but generally the tuned circuit as a whole is corrected using negative temperature coefficient capacitors.

This now brings me to the point of how much correction is really required. For general use long term stability, i.e. no frequency shift over a half to one hour period is rarely needed. For a.m. a shift of say 500 cycles can be tolerated at the operating frequency. Usually short term stability only is required, i.e. no shift in the time to make a contact, say three to four minutes.

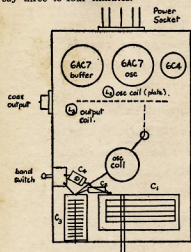


Fig. 3.

Stability of this order can be obtained without correction by careful layout alone. This means placing the frequency determining components as far as possible from the heat sources, viz. tubes. Further, use can be made of the ambient room temperature to maintain stability. By placing coil and capacitor well in the clear with complete access to atmosphere they will attain room temperature readily. This means there will be no guarantee of resettable from day to day, but, providing that room conditions remain constant, temperature effects will be minimised.

One final point concerns VR tubes. These normally do not have a perfectly constant current-voltage curve but something more as in Fig. 1. If portion of the v.f.o. only is switched on for netting purposes, then a different frequency will result due to voltage change on full load. Hence the netting current and the full load current must be arranged to be the same. Those plagued with chirp should check that the no load and full load conditions give the same voltage.

The v.f.o. used at VK3ZFO was built for v.h.f. use where short term stability was the major requirement. Hence the atmospheric method for thermal stabilising was employed. Standard circuitry was used throughout with two exceptions. The filaments were raised above cathode potential, using a divider network from h.t. and a potentiometer was inserted in the buffer amplifier screen to give some drive control.

One other unusual feature is that the buffer is in class B, there being a small amount of grid current. This just happened—there was no deliberate intention to run things this way.

A completely separate power supply was used to remove all possible effects due to power supply loading on transmit. Detailed circuitry is given in Fig. 2 and the layout in Fig. 3.

The buffer and oscillator plate coils are wound on 1" formers and are mounted under the chassis. All com-

ponents other than the frequency determining elements are mounted at the rear of the chassis around the valve pins.

The original unit had a 6C4 Pierce oscillator as well, acting as a crystal marker for spotting and band edge marking, but this has been left out of this description in the interests of clarity.

Throughout this article it has been assumed that the standard references on v.f.o.'s. have been read and their contents noted. I hope that I have managed to convey some of the philosophy behind the statements made in these books and showed a little more clearly what can be done if the pitfalls are known and care is taken to avoid them.

REFERENCES

- A.R.R.L. "Radio Amateur's Handbook."
- "Radiofax Designer's Handbook."
- "The Sideband Handbook," Don Stoner, p.196.
- "S.A.b. for the Radio Amateur," pp. 195-8.

A Restricted Frequency Range Speech Amplifier

W. E. COXON,* VK6AG

RESISTANCE-coupled amplifiers are well known wide range frequency devices, but for Amateur work it is desirable to restrict the range to a value that is adequate for speech purposes. If you cut off both the highs and the lows your voice will sound very much as it is at present, but will allow twice as many stations to work in the already narrow and crowded bands.

If you use an amplifier capable of amplifying frequencies beyond 10,000 cycles you will have a modulated carrier range of over 20,000 cycles—broad! and high fidelity. But what is the point of doing this hi-fi stuff? The average communication receiver will not respond to anything like this frequency range, and a highly selective receiver will further restrict the audio characteristic.

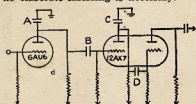
By using an amplifier that is restricted to a range of 5,000 cycles you will not have lost any naturalness, and it is generally recognised that a total bandwidth of from 500 to 2,500 cycles is adequate. The result is that the radio signal will occupy less space in the spectrum. These remarks do not necessarily apply to n.b.f.m. for if the frequency swing caused by the modulation is excessive, then the radio frequency signal will be broad even if the restricted range amplifier is quite narrow.

By the elimination of all frequency below 300 cycles you will actually obtain a stronger signal because no power is used to transmit these lower frequencies, and if the highs are equally restricted with the lows, the voice sounds more natural. It would be better for Amateur Radio if there was a maximum bandwidth allowable.

Now how can we achieve, with the conventional amplifier, these results? Referring to circuit diagram in which all the extraneous items have been left out you will note four condensers A, B, C, D. A and C attenuates the highs, B and D the lows. Increasing

A and C attenuates the highs more and decreasing B and D attenuates further the lows. The value of these condensers can be finally determined by experiment and a frequency run, but for the average speech amplifier they are: A 1500 pF, B 1200 pF, C 1400 pF, and D 600 pF.

The frequency response curve is like a trajectory. At the frequencies of 50 cycles and 10,000 cycles, the response is 40 db. down. This means that the amplifier is clear of 50 cycle hum, and no elaborate shielding is necessary.



Typical Amplifier.
All resistances have a bearing on the value of the condensers for the desired limited frequency range.

So to sum up, it is the use of four condensers, two of which are essential in any case. There need be no constructional problems and a few minutes' work can achieve a very desirable result. It must be appreciated that the distortion should not be too high, otherwise we defeat the purpose of the restricted frequency range of the amplifier.

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The Honorable Gentlemen Said . . .

COMMITTEE TO REVIEW FREQUENCY ALLOCATIONS

The following statement by the Postmaster-General (Mr. Davidson) was the basis of a Press Release issued on 20th May, 1960:—

The Postmaster-General (Mr. Davidson) said in Canberra that the Government had now considered the representations made to it by the Australian Delegation to the Administrative Radio Conference held in Geneva from August to September last year. This Conference, said Mr. Davidson, was considered by all classes of approved users in Australia. It would study the application of the Geneva Conference table and its relevance to Australian conditions in the radio field.

In view of the importance of this whole question, the Government had decided that it would establish a special committee to conduct a review of frequency allocations to all classes of approved users in Australia. It would study the application of the Geneva Conference table and its relevance to Australian conditions in the radio field.

Mr. Davidson further indicated that it was the Government's intention that this committee should be of a widely representative character. It would seek to appoint as chairman a man of independent status and of outstanding academic and technical attainments who would be generally accepted as an authority on radio matters in Geneva. The committee would consist of persons representing those authorities and bodies with a reasonable and legitimate interest in the use of the radio frequency spectrum. These representatives would be drawn from scientific interests, the radio manufacturing industry, commercial users of radio, amateur operators, public utilities, Department of Departments, the Australian Broadcasting Control Board and the Post Office. The latter would provide the necessary administrative support.

The task of this committee will be fairly complex. The first requirement would be an examination of existing frequency allocations and the way in which they are used. One of the table arising out of the Geneva Conference. It would also examine particularly any matters relating to radio frequencies that may arise from the recommendations of the General by the Australian Broadcasting Control Board in regard to broadcasting and television.

One of the committee's other major objectives will be the review of the way in which, in manner in which any further distribution of available frequencies might be made in the overall national interest.

The work of the committee, said Mr. Davidson, will be of particular interest to radio amateurs who, of course, are users of certain of the frequencies involved and who have recently made representations in regard to these matters.

The Government intends that the new committee will survey the whole field of services available for radio frequencies. It will report and to the Postmaster-General. I will then, concluded Mr. Davidson, submit the report and the Government before decisions are taken on this vital issue.

EXTRACTS FROM HANSARD

We print herewith, further extracts from Hansard of 1st and 2nd June, 1960, of comments made by Mr. Wheeler, M.H.R., and Mr. Fairhall, M.H.R., in the House of Representatives.

Mr. Wheeler (Mitchell).— . . . Radio and Television are another highly technical field and it is not surprising that the Office has more by accident than for any special reason. This is a field for specialists, and I believe that they might be able to operate more efficiently than we if they were given the power. There is a definite need for a change of the present system, which is not very successful. Some changes have been made in particular in regard to the allocation of frequencies for radio transmissions, which should never have been permitted to happen. I am especially concerned about the way in which the Government has threatened curtailment of the frequencies allowed to amateur radio operators. These amateur operators have made a very valuable contribution to peace and of war. During World War II, they were invaluable, as they have been in floods, bush fires and other emergencies since.

Australia alone among the nations of the free world wants to cut down the range of frequencies allowed to amateur operators, and it advanced such a proposal at the recent international conference at Geneva. But we other nations refused to do so. We were in the unenviable position of finding ourselves in the totalitarian camp in this matter. Two participants in the Geneva Conference at Geneva, met interested members from both sides of the House within the precincts of this building and gave an undertaking that if these proposals for restricting the amateur bands were not accepted by the other nations they would not be imposed on the Australian amateurs. However, on the proposals being rejected in Geneva, the officials who represented Australia at the conference added to the report of the conference a footnote reserving the right nevertheless to apply the restrictions in Australia. In my opinion, this was a breach of faith and a breaking of the pledge given to members of this House within this very building.

The Postmaster-General (Mr. Davidson) has now been involved in this deception. In such a technical matter, obviously he has to rely on the advice of his departmental officials. I gave him a departmental brief in reply to an inquiry—a brief which stated that the pledge which had been given to the other nations for the Geneva Conference referred not to the amateur bands as a whole, but to only one of them. This is contrary to the clear recollection of the House, and I think that I have conferred with the departmental officers before their departure to attend the conference. I know that the Minister feels that he must defend his position, but I think that in this instance he is carrying loyalty too far, and that the department is acting in a manner unworthy of a great department.

I can conclude only that the conduct of these officials has been so bad, and that they have reached a stage at which the solution of departmental problems is the only thing that matters. The way in which they have restricted these frequencies for other uses is harsh and unfair to some members of the public does not seem to weigh with or concern them. This is a situation which it is the duty of the Government to intervene. I believe that these actions which I have described are a by-product of a situation in which department has allowed for the complete lack of efficient management, and that the sooner it is reconstructed the better . . .

Mr. Fairhall (Paterson).—Mr. Deputy Speaker, it is expected that within the next 24 hours the House will go into recess, leaving still to be considered some of the most important decisions, particularly in the field of the allocation of radio frequencies involving services of two kinds . . .

Mr. Bryant.—Hear, hear!

Mr. Fairhall.—I am glad to hear the chorus of support from the Opposition. Among those looking for a decision by the Government on these important matters will be some 3,000 Australian amateur radio operators, and the honorable member for Mitchell (Mr. Wheeler) referred earlier this evening. Another group waiting for a decision by the Government will be those who are anxiously awaiting the outcome of applications before the Australian Broadcasting Control Board for licences for television stations. These are the tens of thousands of country people who are looking forward to the commencement of country television services.

At the risk of being tediously repetitious, I want to mention once again the position of the Australian amateur radio operators. For more than twelve months, strong and consistent representations have been made in and outside the House, to the Postmaster-General (Mr. Davidson). A good deal of quite minute criticism has been made of the Postmaster-General's Department has been offered, and in my view none of the questions asked on this subject has been adequately answered. I do not want to repeat in detail the story of the last twelve months. I know that the House is generally aware that, almost every day, the Minister has been asked in Parliament were given in quite specific terms an undertaking by senior and responsible officers of the Postmaster-General's Department that the restrictions would not be imposed, repeated, even if only by proxy for the moment. The Postmaster-General holds that there has been no repudiation of that undertaking, but that is simply because a decision

has not yet been taken by the department. Since the Minister said that there has been no repudiation, I understand that he does not like the sound of the term, and I therefore hope that the undertaking will be honoured.

In this matter, Sir, I am concerned not least for the Minister, and I should like to say a word of advice which I believe he has received from senior officers of the Postmaster-General's Department. I want to illustrate by reference to some departmental letters signed by the Postmaster-General which have recently been sent to members of the Parliament which have had representations on this subject. It is only a week or two since I questioned the Minister in this House and asked him was he aware of the undertaking by officers of the department that, failing any alteration in the reservations of frequencies for amateurs at the Geneva conference of the International Telecommunications Union, the Australian reservations would not be altered. The honorable gentleman said that he was well aware of the undertaking.

At this juncture, I should like to read to the House a paragraph from a letter which was recently received from the Minister by an honorable member. It is in these terms—

The assurance which it is implied was given to Members of Parliament by officers with authority to speak for the department in reply to a question concerning the attitude likely to be adopted in Australia if the proposals for alteration of the 1.6-1.8 Mc/sec. band were initiated by the Geneva Conference. The relative proposal was withdrawn and consequently no change will be made in the band concerned.

That was brought out as though it disposed of the whole matter; but of course the clumsy attempt to pass a paragraph in the undertaking referred to only one of the several bands available to amateurs will not hold water. One is surely entitled to ask the Minister what is "implied" because I can assure you, Mr. Speaker, that in my memory, and in the very lively memory of other members on both sides of the House, the Minister has been very much about the undertaking. It was quite unequivocal.

When one goes further into this matter, it is noticeable that letters from the Postmaster-General on this particular subject have continued to state that the position of the amateur is not worse off than his American counterpart in the availability of frequencies and in general conditions. I have made a few remarks in the House, and I am naturally untrue, and I do not know what you have to do to carry the point, because the fact is that all these reservations are on the record, and any honorable member who cares to add them up will see without doubt after five minutes of simple arithmetic that the Postmaster-General's story is just not true, why he continues to send out this sort of letter I, for one, will never understand. In one letter, the Postmaster-General stated—

. . . bearing in mind that Australian numerical allocations of 4,000 will have substantially the same frequency space for their use as do their 200,000 brother enthusiasts in the United States of America.

Now, this is one of those cases where simple arithmetic is not held. It is not true to say that 200,000 amateurs in America ought to have 50 times the space available to Australians because, in fact, they all operate within the same narrow frequency band. Put the operative words of that correspondence are contained in the phrase "have substantially the same frequency space". If you go on to examine this proposition, it would be best to look perhaps at the three top bands—the lower frequency bands—which are most used for international intercommunication services by the Australian amateurs. In the field of 1.8 to 2 megacycles, the Americans have 50 kilocycles wide and the Australians have none. In the field of 3 megacycles, the Americans have 500 kc. and the Australians 300, and in the field of 7 megacycles the Americans have 200 kilocycles against the 100 of the Americans have 450 kilocycles against America's 850. If the proposals now under active consideration are put into operation, the total difference will stand down to 100 kilocycles. The difference will be 850 in America, because these reservations continue, and in Australia the figure will be 100. This is just a little more than one third of the American reservations. Now, in

problem before us. I say again that I do not believe that a job of this magnitude and all the difficulties presented by it can be dealt with on an ad hoc basis. I should like to know when we propose to stop temporizing with this problem and separate the control of this great section of the Postmaster-General's present responsibilities—for reasons well stated by the honorable member for Mitchell (Mr. Wheeler) earlier this evening—and put them in the hands of a responsible, completely independent organisation which is impartial and not controlled by users of radio frequencies.

The important point about all of this is that we have a continuing problem; one which changes its very shape, magnitude and kind as the years go by. And as we see more and rapid technological development in electronics, unless we in this country set up a competent, long-term body to deal with every aspect of this problem as it develops, we will not merely get ourselves into a complete mess but into a mess from which we will not be able to extract ourselves.

Here is an extract from Hansard of 2nd June, 1960, of further comments on the subject by Senator Wood made in the Senate:

Senator Wood (Queensland).—When speaking during a debate on a supply bill some time ago I asked some lengthy questions with relation to the band of radio frequencies allocated to amateur operators. Much has happened in connection with this matter since that time, and I have a few remarks which I would like to make before the Parliament rises for the winter recess. I would remind the Government that members of both Houses of the Parliament are watching with close attention the move that has been made by the radio section of the Postmaster-General's Department to impose a new measure of harsh and unwarranted restriction on the activities of radio amateurs in Australia.

This is an issue in which the good faith of the Government is under test. Twelve months ago, as a result of widespread protest on behalf of amateurs by members on both sides of both Houses of the Parliament, the Postmaster-General (Mr. Davidson) summoned two senior officers of his department to Canberra to confer with members of the Parlia-

ment. These two officers came to act as spokesmen for the Minister on a technical subject, on some of the details of which the Postmaster-General himself was, understandably, not expert. He gave these two officers his charter to speak for him.

In the course of their discussions with members they gave an unambiguous promise that if the proposals they had developed for further restrictions on amateurs were rejected by the International Telecommunications Union at the conference that it was about to convene in Geneva, the Commonwealth would accept the judgment of that conference and would not impose the proposed cuts in Australia. The conference has given its judgment. The most competent technical tribunal in the world has found that the Australian proposals were unnecessary, unjustified and harsh. It has thrown them out summarily.

Ordinarily, that would be the end of the matter, but subsequent developments give the strongest grounds for concern. One is the fact that, despite the undertakings given here a year ago, the very two officers who gave those undertakings in Canberra sought to evade them in Geneva, by writing into the treaty there drafted a postscript which would give Australia the right to make the cuts in frequency allocations for amateurs within Australia, even though such cuts had been rejected elsewhere. The writing of that postscript was a brazen act of moral repudiation which gravely fore-shadows an intention by the departmental officers to attempt to repudiate in fact.

The second development is the announcement by the Postmaster-General that an ad hoc committee is to be appointed to consider generally, during the coming parliamentary recess, the use of radio frequencies in Australia. This committee could do a productive job if its members were chosen from persons with an objective outlook, and if the undertaking given to preserve the frequencies at present used by amateurs were made clear to the committee at the outset of its inquiry. I hope the Postmaster-General will do this. Unless the position of amateurs is thus safeguarded at the outset, the committee could be used by the Postal Department as a back-door method of applying the cuts it has promised not to impose. Honorable senators know perfectly well that a committee of inquiry can be selected in advance which will produce exactly the finding

that the government, or the government officers, selecting the personnel of that committee want it to produce, particularly if a government department with an axe to grind has a disproportionate influence on the committee's investigations.

I hope that the Postmaster-General has not been led by departmental subterfuge into the notion of being party to another departmental attack on the rights of radio amateurs in Australia. The fears that this may be so are given weight by two serious recent events. As the report of the Geneva conference shows, the Australian official delegates carried their anti-amateur campaign to unprecedented lengths, even voting with countries in the Communist bloc against liberalising measures for amateur radio sponsored by Britain, the United States and the other democracies. This fact alone destroys all faith in the department's goodwill towards amateurs and contradicts the claim of the department that such goodwill exists.

The second occurrence which eloquently illustrates the real attitude of the department towards amateurs is that which was related by Senator Hannan, who told us an amazing story of a departmental attack on a Melbourne amateur who gave an instructional radio demonstration during a children's session on television. In that case the attack by the department has been marked by aggressiveness, evasion and mis-statement which must surely be without parallel. It is now more than a year since the unfortunate victim gave the demonstration complained of, but he has still received no departmental apology for the treatment to which he was subjected. In these circumstances one can have no confidence in the department's claim that it intends to give Australian amateurs a fair deal.

Our radio amateurs are citizens of very real worth. We know that during various national crises, such as when disastrous floods have occurred in northern New South Wales and other districts, the radio amateurs have given great assistance. As a resident of North Queensland, I know of the very valuable work they have done when cyclones have ravaged that part of Australia. For this reason alone I believe that every encouragement should be extended to them, and that the Postal Department should not attempt to build a wall of obstruction to bar their progress and development.

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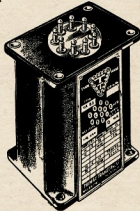
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CORRESPONDENCE

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THIRD PARTY TRAFFIC

Editor "A.R." Dear Sir,

The granting of third party traffic privileges to all Amateur transmitting stations is a reform which is long overdue. Over half of the world's Amateurs enjoy these privileges already; the remainder are still looked upon by authority as "experimenters" pure and simple. There was a time when all Amateurs were experimenters, but those of the amateur spirit have progressed has been so rapid in the field of electronics that there are few whose financial status and technical knowledge are sufficient to keep them abreast of the progress of industry and government laboratories. Amateurs do make an important contribution to the science of radio, of course, but those who imagine that Amateurs are tireless research workers whose one idea is to probe into the unknown are thirty years behind the times.

It is noteworthy that the P.M.G. Department in the United Kingdom has not yet introduced some five years ago and deleted the clauses in the regulations which required station licensees to experiment. Instead, they decided that the Amateur licence was issued to enable the licensee to undergo "self-training in the art of radio communication". This was not to say that those of an experimental turn of mind should not indulge themselves, but it did allow those whose interests lay elsewhere greater freedom to enter their hobby in any way they wanted. And it also laid the emphasis where it belonged—on communication.

That third party traffic would help to further the cause of communication cannot be denied. In traffic handling the message being sent must get through intact. There can be no question of "filling in the gaps" by inspired guesswork, either because of sudden loss of QRM made the sending station sound like a Chinese opera, or because the other fellow was sending so fast you didn't like to admit that you couldn't keep up with him. The art of accurate communication would call for high standards of station efficiency and operating technique. The amateur use of the element of break-in, voice control, R.T.T.Y. and other aids.

It follows that not everyone will participate, and in the use of the element of break-in it will not be inconvenienced by traffic-handling. It could be confined to, say, the first ten kc. of the c.w. and phone sections of each band.

Any voice procedure that would be traffic-handling into the Commonwealth is bound to encroach on the prerogative of the P.M.G. Department and, this being so, the Department would naturally regard it as a bad thing all round. Its objections would probably be (a) the Department considers that channels owned, operated and controlled by the Department should be used for the proper channels for the transmission of traffic; (b) the paper work involved in making the necessary entries in the regulations; and (c) loss of revenue.

Let us deal with these points. The answers are surprisingly simple.

(a) By laying down rules to indicate what does, and what does not, constitute a legitimate Amateur telegram (e.g. not more than 15 words of conventional greeting—or any stipulation the Department accres to make), and by requiring that copies of all telegrams sent and received be kept for a specified period of time, and that file to be open for inspection at all reasonable times by any authorised officer of the Department, the Department would exercise a measure of control over the traffic handling. It should not be difficult to devise other safeguards if necessary.

(b) The above could be written into existing regulations as follows:—

(i) The Department's definition of what constitutes a proper message to be included in a re-written Para 67(a).

(ii) Para 67(a) to read: "Messages or visual images on behalf of third parties, except as laid down in Para 68".

(iii) A reference to the inspection of the message file to be included in Para 104.

(iv) Add a new appendix (Appendix B) showing the layout of a message (premise, words, count, text, signature, collation, etc.).

(c) It is doubtful whether the Department would experience any loss in revenue at all. It must be remembered that messages will be accepted by Amateur operators on the understanding that (i) the message is free (non-acceptance of remuneration is already covered in existing regulations), and (ii) there is no guarantee that the message will be delivered to its destination within a certain time—or even at all. This being so, it is certain that not a single word of the intelligence normally conveyed by letter, telephone or G.P.O. telegraph services will be re-routed through Amateur channels. On the contrary, messages will only be originated on the basis of "Well, if you're sure it won't cost me anything, perhaps you could send a wire to my cousin George in Tasmania and let him we're all getting along fine." In other words, messages which would not otherwise have been sent. It is probable, too, that the operator receiving a message for delivery in his area will either telephone it, or post it on to the addressee. Thus we see, in this instance, that the originator is pleased, cousin George is cheered up, the P.M.G. has collected some revenue, and two or more Amateurs feel a sense of satisfaction in having done a useful job, and of having been able to help somebody.

From the foregoing, it will be seen that the hardest thing the Department will be called upon to do is to overcome a very natural reluctance to subvert the amateur status privilege. But it would be able to frame the rules, and it would be dealing with responsible citizens (if the Department did not believe us to be responsible, it could not issue our licences). Furthermore, it would encourage the growth of a secondary command in the amateur ranks, and a new moonwealth—a very handy thing for a nation to possess in time of emergency.

I would therefore say to the Department: "Take a chance—you won't regret it."

—A. J. Jeffrey, VK6AJ.

Editor "A.R." Dear Sir,

I read with interest in this month's "A.R." the letter written by Ben Pooley, VK3BP, concerning third party traffic and emergencies. I agree with him and his desire to have some sort of organising along these lines if possible.

I am not in a position as yet to join the W.I.C.E.N., but I hope to when circumstances permit.

Standardising the frequencies used would be a good idea. The band 1840 Kc. to 1860 Kc. might be a good one for the W.I.C.E.N. practices on as it is not available for general Amateur use. I don't know which bands are used by W.I.C.E.N., but the use of say two bands—one for short distances and the other for long distance operation would be desirable. If one band could fulfill both of these requirements all the good. Standardising the bands used in all Divisions, and the frequencies would help to unify this service.

Possibly the equipment used could be gradually changed to a more uniform type suitable for the particular service envisaged for it. The more the equipment the better, combined with good, reliable operation. It would not be necessary to work DX or to have particularly high quality modulation—if telephony is used.

These are only my own ideas on the matter and some evidence of interest in the P.M.G.'s Department could be persuaded to see the advantages of operation as suggested by me.

I don't know what goes on in the W.I.C.E.N. networks so why not let us know what goes on, we would be interested.

Rodney Champness, VK5ZCD.

"A WORD TO THE WISE"

Editor "A.R." Dear Sir,

In the June issue of "Amateur Radio", under the title of "A Word to the Wise", the editor of the family correspondence authorities use "Red" as the colour for the earth lead.

Insofar as the United Kingdom is concerned, the official system specifies "Red" for live, "Blue" for neutral, and "Green" for earth.

It will be found that all reputable British equipment manufacturers adhere to this scheme, although sometimes the colour "Green" is substituted for "Yellow" in the earth lead.

Finally, always check all plug connections, both at the load and source end.

—Fred Jenkins, VK5WS (G3WS).

AMATEUR TELEVISION

Editor "A.R." Dear Sir,

Apparently we have among us many Amateurs who are interested in Amateur television, but we hear all too little of what is actually being done in this field. As I see it being done, it is interesting to know, and in fact means very little when it comes to making use of our experimental permits.

As there is a need for a certain amount of co-ordination in A.T.V. constructional work, and for a certain standard of standards and frequencies, how about a description of his equipment by each active experimenter and so let others know what is being done. Well known examples of A.T.V. activity is the work by 6EC 3AAK and 3AUX to mention a few, and no doubt others are quietly building various items for picture transmission.

To add weight to this proposal I would like to describe my own A.T.V. gear and the frequencies used. A vestigial sideband transmitter similar to that proposed by 6EC has been built and is followed by a QEQ03/20 linear amplifier on the 1 metre band. This transmitter is complete with a.m. video and f.m. audio modulators, and follows the Australian Standard. The frequencies used are 290.25 Mc. and 295.75 Mc. leaving the lower 2 Mc. of the 1 metre band for more picture transmission.

A flying spot scanner using a 3BP1, and a 931A provides the video modulation, the medium persistence of the c.r.t. being greatly overcome by d.c. clipping and gamma correction. This unit is suitable for simple test patterns and call sign.

A modified loran indicator unit, as well as being a useful oscilloscope, provides synchronising pulses from a 100 Kc. crystal oscillator-frequency divider chain.

The receiver is a crystal locked converter 6BC4, 6P8S, 6AK5, 12AT7 x 2 from 1 metre to channel 1 of a standard i.v. receiver. I have chosen a 100 Kc. crystal, as being the most suitable for this purpose. A parametric converter is under construction for use as a low noise broadband preamplifier. The antenna consists of 16 driven elements in front of a chicken wire reflector.

From tests conducted between Melbourne and Geelong there seems no doubt that high radiation from the antenna is required, and is essential for those of us who must operate over such distances.

R. J. Highway, VK3ABK/T.

THE R.S.G.B. AND R.T.T.Y.

Editor "A.R." Dear Sir,

There appears to be some misapprehension in certain quarters regarding the attitude of the R.S.G.B. towards R.T.T.Y. The position is, here in the United Kingdom there is a small but flourishing group interested in this method of communication—the British Amateur Radio Telegraphers' Group—which works in close collaboration with the R.S.G.B. Indeed, the Honorary Secretary of the Group, Dr. A. C. Gee has been elected to the R.S.G.B. and is responsible for technical standards for Amateur Radio Telegrapher operation which will be submitted to a conference of Region 1, I.A.R.U. Societies at Folkestone in September. The R.S.G.B. has been prepared at the request of the R.S.G.B.

Despite the difficulties, interest in R.T.T.Y. is growing in the U.K. Suitable equipment is not easy to come by, but small quantities do become available, from time to time at prices which Amateurs can afford. Such equipment is quickly snapped up.

I should be glad if you would let your readers know that, far from wishing to discourage interest in R.T.T.Y., as has apparently been suggested in some quarters, the R.S.G.B. hopes that many more British Amateurs will experiment with this branch of Amateur Radio.

—John Clarricoats, O.B.E. (G6CL), General Secretary, R.S.G.B.

NEW PUBLICATION—DX'ER

Editor "A.R." Dear Sir,

I have a note to send from Sven Elfving, SM3-310, who is SM3594 who is one of Europe's top S.W.'s and the editor of the DX'er, a publication of the Polar Bears Radio Club. This publication is a very up-to-date in the DX field and other points of interest for the S.W. Surface mail is slow, but airmail will keep any reader up to date. Any interested parties in the UK may have full details from myself, Tim Mills, VK2ZTM (WIA-12053), 19 Bullecourt Av., Mossman, N.S.W.

—Tim Mills, VK2ZTM.

PREDICTION CHART, JULY '60

Mc. E. AUSTRALIA — W. EUROPE S.R. Mc.
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W. AUSTRALIA — FAR EAST
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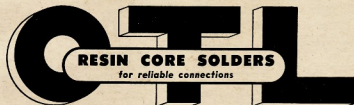
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NOTES

FEDERAL

JAMBOREE-ON-THE-AIR

The Jamboree-on-the-Air will take place on the week-end of October 22-23, 1960 (midnight to midnight GMT). The regulations are as follows:

Any Radio Amateur with a past or present association with the Scout movement or operating on behalf of a Scout unit may take part. To join the event one simply calls "CQ Jamboree". Stations may operate on any Amateur wave band and with any equipment that is consistent with licence requirements. All participants must strictly observe their licence regulations. Either phone or c.w. may be used.

The Jamboree-on-the-Air is not a contest and there will be no prizes to the operator making the most contacts. The event is organized with the sole purpose of promoting contacts between Scouts of different countries, but it will, of course, include valuable signalling training for boys who take part.

The Boy Scouts International Bureau (77 Metcalfe Street, Ottawa 4, Canada) will operate from a station in Ottawa, call sign VE3JAM, on any of the following approximate frequencies: 28.450 Kc., 21.230 Kc., 14.175 Kc., 7.100 Kc., and 3.750 Kc.

Amateurs wishing to take part should contact the nearest Scout unit or the National Scout Headquarters in your country.

U.S. CALL BOOK MAGAZINE

Federal Executive has for the 25th year paid a few copies of the following issues of this monumental directory of Hams: Winter 1958/59 (United States only), Winter 1958/59 (Worldwide), Summer 1959, and Summer 1960. Write to: Treasurer, Bob Boase, 65a Franklin St., Melbourne, Vic.

FEDERAL QSL BUREAU

The Bloemfontein Branch of the South African Radio League ran an official station 254UT during celebrations held during May to commemorate the Union Jubilee Celebrations which commemorated the jubilee of the founding of the Union of the four Provinces. Unfortunately details of the Treasurer, the functions being held. An unusual QSL card will be sent to all stations who made contact.

Signs heard from VE8AAE/SU belong to the station of New Zealand born Des Taylor, who is serving with U.N.E.F. Forces in the Golan Strip. Des is posted in the area mostly on 14 Mc., and will be in the area for one year. He requests QSLs via H.R.G.T. or the VED Bureau.

Signs heard on pending out cards for RL9KT from Seoul, South Korea, says: "Sorry cards are so late. Due to a turnover in operators and a just going out of the Treasurer, old QSL files and mailing cards for QSOs that have never been confirmed."

The Federal Bureau is holding a card from J7IAD addressed to VK3AR. The card relates to a QSO on 14 Mc. c.w. at 1130z on 22nd September, 1959. Lawful owner may have it on application.

—Ray Jones, VK3RJ, Manager.

FEDERAL AWARDS

Two further W.A.V.K.C.A. Certificates have been issued as under:

No. 132—W9QGR, Ray Bayer.

No. 133—W7XLA, Harold Bennett.

—A. Kissick, VK3BK, Manager.

NEW SOUTH WALES

Forty-eight persons attended the May meeting which was held on 26th May in Science House, Gloucester Street, City. Proceedings were commenced at 8 p.m. when the President (Mr. C. D. Dwyer) welcomed the guests. Meeting Purpose of which was to deal with the Council's recommendation to bestow Life Membership upon Major Collett (2RU) "in recognition of his services over a period of many

years to the N.S.W. Division of the W.I.A. and to Amateur Radio generally."

The sponsors of the proposal, Max ZMP and Dave ZRO, spoke of Major's active association with Amateur Radio and the Division, particularly in respect of the Central Coast Section (formerly Gosford Amateur Radio Club). Readers will recall that Major was one of the founders of this flourishing section of the Division. Ted ZACD also spoke briefly of Major's activities and, when placed before the meeting, the resolution was carried unanimously. Congratulations, Major.

The President then closed the Extraordinary Meeting and opened the monthly meeting. After the usual formalities had been attended to, a Notice of Motion from Arthur ZPM was seconded for discussion. The theme of the Notice of Motion was for some form of recognition of the founders of the Division. The motion was carried after lively discussion of the motion, it was resolved that a suitably inscribed plaque recording the particulars relative to the official opening of Dural be affixed to the VK2WI building. Other business included a resolution regarding the VK2 Bulletin and a report from Federal Council.

The lecture for the evening, "The Construction of Components and Their Behaviour at Very High Frequencies", was delivered by Mr. J. H. Barry, Z2, of the Dural plant. The construction of capacitors, resistors and valve sockets and of the limits of performance of each type. Several examples from a manual of the VK2WI production line were shown for inspection and aroused the interest of the audience (and the wrath of the cleaner). The vote to take an interval was carried and the evening passed with acclamation by the appreciative audience.

Club of the month is the recently-formed Young and District Amateur Radio Club. From liaison officer, Peter ZAPP, comes news of increased membership and activity. Peter also advises that the club intend to enter a transmitter, operating transmitting, receiving and test gear at the Young District Show in September. The display will be located in the Exhibition Pavilion and it is intended to operate a transmitter during the two days of the show. Good show!

Club liaison officers are again reminded to contact VK2W1 before the Sunday morning broadcast, to advise of any changes in their monthly reports of your club's activities to the Divisional Publicity Officer, ZMP.

Stop Press: The Council of the Division at its last meeting received a letter of resignation from Ted Whitting, ZACD. Because of private and business reasons, Ted considered it unwise to continue in the position of President to the members of the Division. It is an unfortunate loss to the Division and it is hoped that at a later date Ted will again be able to take an active part in the Divisional activities. Bill Lewis, VK2VB, has been appointed President for the remainder of the term of office of the present Council.

HUNTER BRANCH

VKs 2AKX, 2SP, 2AYL, 2RJ, 2ZL, 2ZJR, 2ZNN, 2ZDC, 2ZT, 2FP, 2A, 2C, 2QJ, 2ZAV, 2AQZs, active in the districts Sutherland, Finlayson, Richardson, Stobbs, Gray, Fyfe, Bailey were in attendance at the May meeting to hear John H. Barry, Z2, of the Dural plant. The meeting was held at the home of Mr. Barry, concerning v. and u.h.f. John, with his 6,000 meg. t.v. links, parabolic arrays and klystrons, held interest throughout and there is no doubt we will see him very soon submitting his own papers and always seem to learn something new.

Harry ZAPF, who is still not the best, sent his apologies. Lionel, of 2AWX, is still being relieved of his responsibilities and thanks are due to 2XT, 2AYL and 2SP. Wal 3AKH celebrated his 75th birthday during the month and is still as young and vigorous as ever—keeps in trim by climbing horizontal poles attaching and removing them.

A mob of Yanks were in town recently, but only Fred ("Tiny") Lee, K5OJL, accepted the hospitality of 2XT and 2CS. Tiny said the time when they were preoccupied with the notion of skirt chasing. Earlier in the month, the Goons could be heard working ZIs on 40 around 0700 hours. After a day of course full of some people. Dave 2BZ was porting at Surfers in the Premier and Sunshine State and has since returned, feeling the benefit and ready and willing for another year of service.

Our honorable Secretary must scratch his head with his big toe in trouble with a splinter in his big toe, what is that contact and putting and moderating his voice whilst on holidays. Ben ZABT passed through Newcastle after hesitating overnight at Cousin Bill 2ZL. The time of the meeting was short after her op. If Ben is absent from the air for any length of time, don't worry, he probably only went through another red light and this time the cops saw him.

Loud and long have been walls around Fennell Bay—if you want a fight, ask Zulu Lulu how is his multimeter. Just as well he has more points than a porcupine. Our beloved President, the Lions, has been a bit of a pest. It must be interesting to see him up the pole or rather ladder as I am sure half the time he would be painting with his pipe and smoking. The Lions has been a bit of a pest. The test gear, Frank ZFX now has his leg out of plaster, but understand that the Doctor, sorry, the man with the medical degree, is not too pleased with the result.

Les ZAFOR came out of hibernation and spoke to a few choice friends; said he had been a bit of a pest or lazy or something. He said he had to replace a couple of masts which were chopped down by the T. Valley Indians. It is the time to start thinking about a diet and a trim for 1st October when your Branch Annual Dinner will take place with of course the Blackalls Field Day to follow. The July meeting will be on Friday, 8th, at University of N.S.W., Tighs Hill, whilst Bill Hall will be at Home to all comers on Wednesday 27th. Both times 8 p.m.

CENTRAL COAST ZONE

Major ZRU is absent on a short fact-finding mission to VK3 with some other Rotarians. The Central Coast Zone has been missed from the Monday night round-up at 2030 hours on 3635 Kc. Gosford Club is very busy to find out what is going on in the room. The room is empty. They are Alec Swinton, Ken Harriman, and Geoff Gill (native of Bristol, wait till you hear him on phone). John ZATJ is a bit of a pest. He has been a bit of a pest, has brought a slight hull in people's ill. Trevor ZTM, of Woy Woy, has the screen modulation going on his contacts on 40 and 80. Fred ZALA is now a DX man, having worked a VE in fine style on 20. I don't expect to see him on 40 for months. Reg ZAI has also tested DX, having worked France on 20 one afternoon using an AT21, doubling in the final. He has another trip to VK3 in the end. So you should have a bit of a mobile s.s. piggyback again.

The club enjoyed an excellent lecture-demonstration from associate John Brier in May on "Technical Problems of an Electricity Undertaking". He said that the 1000 cycle remote relays worked and that they could be used to bring in 21 different circuits on pushing the correct button. The audio generator is a k.w. and the motor-generator. Wal 3AKH is active on 40 and 80. Jack ZFJ is heard occasionally. The lure of Channel 2 is spreading. It is a bit of a pest. He hopes to move into Biedam Parade, sorry, I meant Headlam Parade, chaps. It so happens that two other Hams are also moving into the area. One is called ZERN, planning a bigger s.s. signal with an 813 linear in AB1 and is active on 40 and 80.

VICTORIA

NEEDLING AND WHEELING SECTION

Yes, it's the same as last month, but with a different twist. As this becomes part two of the "Needling and Wheeling" series, the basic principles laid down last month will have to be followed and the tempo of the instruction stepped up.

Of course, the pins—conscience pricking for the use of—may not have been sharp enough or possibly the more the needling and wheeling epidermis to penetrate. However, whatever the reason it is sad to have to relate this information to the needling and wheeling forms. The information material has been shorter than a half wave on 10 gigacycles. Getting a 7M4 or equivalent out of that W would be easy.

Perhaps shock has taken toll of the weaker chaps and the others probably don't read the magazine anyway. But if it is started offering the month on, on secluded Pacific and expenses and all found, mind you—for news—strictly rare DX of course—I'd come along as an unofficial observer and write a book on the doings! Might be something in it at that. But then I'd probably be the only applicant!

It's a funny thing, no matter to what organization you belong, there are always the characters who want to resist change. Amateur Radio is no exception and unfortunately the change is coming. It is because of the passage of time has given them a few grey hairs or alternatively denuded them, that wisdom automatically follows.

The time has come that used logically and with a spirit of progress, the wisdom of old age can be an inspiration to the younger members of the community and in particular our Amateur organisation.

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Accessories:
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Unfortunately there is a tendency to decry the efforts of the younger members of the Institute who are trying to put a bit of red blood into a rather anemic descendant. The s.w.'s, limited operators, and generally those young up and coming members of the Amateur movement are largely deciding the destiny of Amateur Radio at the moment. You might like to have a hobby when you are in your wheel chair, so give all the encouragement, constructive criticism, and progressive thinking you can to the younger members.

This point was raised by 3AKJ during one of the Sunday broadcasts and I think that it is worthy of your attention and action. The question is the one of populating or perishing, and I mean populating the Amateur ranks with new members. Remember your own start in Amateur Radio?

The A.R.R.L. Handbook was probably the first thing you bought and treasured with that hard earned 829B or something.

What about donating a copy—not too old—to the local High or Technical School and encourage the young and enthusiastic lads? I can personally vouch that they are read in two High Schools. Even a local library would take your donation, and to those proud fathers who have offsprings at Secondary School, it would certainly buck the old ego no end to find that Junior has been saying that my Dad gave the library a book on radio!

Had enough? Well you might find something of interest in the next section. Read on!

THE VILLAGE MOOT

The beginning of the month provided another entertaining evening apart from the excellent selection of films on t.v. tube manufacture. I was acting Secretary for the meeting and unfortunately failed to keep track of points that would make interesting copy.

However, the presentation of the balance sheet and resulting comment led one to believe that an inquisition in the bankruptcy court must be an every day occurrence to some chaps. Some people have suspicious minds! Seriously though, it was evident that quite some thought will have to be given to a few points by Council, and it was pleasant to hear voices raised in query and getting answers, what is more.

Finance worries me—I always cross the road when passing my bank—so hurrying quickly on we had a few comments on other matters, especially one about 3WI, and its re-building. Like lots of other things, this has been left to a few chaps and such a colossal task needs more than a few. Anyone with any ideas, or offers to help?

My earlier reference to legal matters reminds me that we have in our midst a formidable L.B. who takes on terribly exciting cases like parking offences, etc. The Federal Councillors Club may well require his services when they are putting in their briefs for increased margins, pensions and other benefits!

I haven't heard any comments on the broadcast since the last issue, but it has been cold these mornings and country chaps are forgiven for having a sleep-in on Sundays.

Some comment on the call-up after the broadcast has been to the effect that it should revert to the original zone call-up. If that's what you want, put it on paper and it'll be considered by the proper authority.

By the time this appears and is read (I hope) the Eastern Zone Convention will have been and gone and next issue should contain some of the more publishable doings from the Wise Men of the East. I will be there in person so your report will contain all the pertinent truths, which, of course, is the basis of any good reporting!

GENERAL AND IMPERSONAL

The club rooms appear to have come in for a bit of criticism lately, not very much, but enough to have people thinking about it. Rest assured chaps that Council have plans in hand to improve the club rooms. You can read in the last issue of plans to improve the library. As members you are the ones that will benefit by all these activities so what about a few words outlining your requirements? Remember half a dozen people can think of everything! Who knows, we might even be able to provide facilities for checking that tx to end all tx's with power supplies, prods, meters, etc., etc. What think you of that?

At the next monthly meeting Jim Goding will be giving the lecture. I understand that the subject will revolve around Electronics and its application to Medicine.

Library.—As promised last month, here are titles of a few articles that have appeared in recent magazines received at VK3. Maybe of interest to someone.

"QST," May 1960: "A Three Tube Filter Rig." An inexpensive rig for one band though

can be arranged for any band. Uses 5 and 8 odd meg. xtals. "A V.t.v.m. R.f. Probe." Can be used with any v.t.v.m. and would be suitable for r.f. up to 21 volts r.m.s. "Technical Correspondence." Three band single xtal conversion oscillator.

"Break-In," April 1969; "Multiband Heterodyne V.f.o. for S.s.b. and A.m., Part 2." Refer to Part 1 for full details.

R.S.G.B., March 1960: "Break-in operation with Geloso Signal Shifter." Details as to how to make basic modifications to the Geloso and circuit for adding grid block time sequence keying.

"CQ." April 1960: "The G4ZU 'Bird Cage' Antenna." (Re-printed in this issue.—Ed.)

IN CONCLUSION

Council notes and information from other sources haven't been received at the time of writing this. Bad luck chaps, try again this month and I'll put something in for you.

P.S.—The S.W.L. Group would like receivers for use by members. Although you don't have to give away that spare 75A4, they would appreciate something of lesser pedigree. Maurice Cox is the man to receive those AR7s, HRO, etc., etc.

WESTERN ZONE

Many members of the zone were all smiles after the recent heavy rains because not only is it a good start for the season, but radiation levels are dropping. The humidity is making the earth. Plenty of wire in the air seems to be in fashion these days. Herb 3NN has extended the legs of his Channel 2 DX Rhombic to over 1000 ft. He has also extended the legs of his extended vee beams to 820 ft. with his eye on 20 and 15 mx. Keith 3ATS, although busily cropping, is still able to work a few on 20 and 15 mx. We are all looking forward to the 30's. Keith, we won't stand a chance then. Keith 3QG, a newcomer to the ranks, is now active on 80 mx. He had no sooner erected his antenna when he had to pull it out in rain and shift QTH from Horsham to Murtoa.

Vic. 3AEG is practically with us again after a long absence caused by shifting QTH plus shop renovations, not to mention a complete re-build of the rig from the v.f.o. through aerial tuning unit. Reg 3ZFD lost his multi-element (approx. 15) 2 mx beam in the last gale but is still firing signals nicely into Ballarat and Melbourne, using the old faithful five over five.

All members of the zone were saddened at the news of the recent passing of Mrs. Kinsella. Her efforts at many of the Western Zone Conventions will be well remembered and our sympathies are extended to Bill and Carmel.

MOORABBIN & DISTRICT RADIO CLUB

On Friday evening, 3rd June, we held our mid-year party, and very successful too with members and a few visitors, refreshments both liquid and solid, and good cheer was the theme throughout.

At our general meeting on Friday, 17th, Max SABO gave a talk on technical subjects, some projects which he has in hand at the moment, mostly transistor equipment, which were lapped up by all and sundry.

On Saturday, 18th June, a very successful card party was held at the home of Arthur SAWO. Thanks are extended to Arthur, and especially to Mrs. Oakes for a wonderful evening. There will be more of these card parties.

The club room is now in good shape, and the transmitter ready to go on the air as soon as the antennae are erected. You should be contacting 3APC shortly.

The club is in need of new members, new blood to give it that extra boost which means progress, so if any readers are interested contact me, 3LC, at BY 3918 any time of day or evening. You can be sure of some good fellowship and interesting evenings.

QUEENSLAND

BRISBANE AND DISTRICT

This month we are pleased to note that an old member of the Division has rejoined the ranks. From relicensing in 1946 until the early fifties, it was unusual for a day to pass when the call sign 4WF was not heard on one of the bands, especially in the hunt for DX. Then

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Arch 5XK, the unofficial mayor of Lucinda, has been a regular correspondent of mine for some weeks now, and his letters have been filled with material on subjects as diverse as Council, the VKS Division in general, the VKS Journal, and sundry other topics and persons. I have not always agreed with everything he says, I must admit that a good deal of what he writes concerning the country members and their topics make good sense, but I am sure he has more experience with such a subject than Arch. I believe that Council intends to publish one of the letters in the next issue of the Journal, and this is all to the good, because it shows that we are an open-minded Council and anxious to do the right thing by the members. I wish, however, I could forget also that a member who has the courage of his convictions to complain openly, is much better than one who sits silent at the meeting and then grizzles outside on the footpath.

The S.E. members of the VKS Division held their usual monthly meeting this month, and it developed into an old-timers night with a discussion on the equipment used in the 20's and the 30's. Col. A.J. had taken along several copies of pre-war S.A. and QST, with the intention of showing the amateur members just how made things tick in those days, and of course this started things going in fine style. Claude 5CH, the old 30's, was able to delve back into the past a bit further than anyone else, and the discussion which followed proved that there is a keen interest in those days. The younger members and so the older members have decided to bring into their junk-box before the next meeting, and bring along many a few years' worth to the next meeting. It has been suggested that I bring along my coherer, but as we are using it for a salt and pepper shaker these days, I had to reluctantly decline the invitation.

Claude 5CH is gradually getting the new tx completed, and having a few contacts on 7 Mc. Ron 5TW is another who is getting his share of contacts. Stuart 6MS is still keeping his G skeds, but if the local paper can be taken for gospel, then his daughter Maxine has announced her engagement. Even though I have no experience, and also my pocket, I would hazard a guess that the new rx that he has been talking about is in jeopardy. Erg 5GJ has been very busy at his vocation, but is finding time to lay some paint on the new tower, work and work.

Paul 5H is the newest member of the group, and has had a busy month. His new church has been opened and it is an imposing building, complete with hearing aids, and he has been getting a lot of attention from the rapt attention from his congregation who were using the hearing aids at the opening service, but he has a few new years' worth. I discovered that due to a faulty ear lead on the mike, they were hearing "loud and clear" the "Top 40" from the local bc station, and I was sure that the new members and tribulations, he is getting some gear together, and it should not be long before he will be able to give a few years' worth to the QSO's some day. Don't you listen to anybody who will tell you that I am never on, it is a libel.

Col. A.J. has been trying different types of aerial couples in an endeavour to load up a bit better on 40 mc, and after finding a circuit in an old "A.R.", which claimed to be able to load up on 40 mc, even into the 30's, he found it a go and is more than satisfied with his results on 80 and 40 mc. For the benefit of peasants such as I, Col., what was the year and month of the mag?

WESTERN AUSTRALIA

The monthly meeting for June was again held at Mend's St. hall and again brought the usual attendance, the feature for the evening was a demonstration by Ron 5XK, the "new" Topper. Ron brought along his own home-made rig as a demonstration and a beautiful demo. rig it was. The work must have been put into it. Fortunately Ron was in the position at the time to obtain the good components it consisted of at a very low price. The rig was a 200 mc. rig, well in excess of £100 plus many db. to make a similar rig today. Many of those present would have been led by Ron to have a look at it. It is not only a nice professional looking job, but it also produces 5 x 9 signals world-wide as Ron has proved. Everybody was with a firm resolution to re-build their own rig.

The monthly Council meeting was held at the QTH of Cole 5CK. While present, the meeting fortunately was not able to attend these two

meetings as I was away in the bush. The main topic of the evening was the amalgamation of the Radio Society and the W.L.A., which has been agreed to. There was some doubt as to whether the life members of the Radio Society would be accepted as life members of the W.L.A. 6CS was the only connoisseur who was against the proposal and I believe the meeting took on rather a heated argument. Then 6KW was put to the vote, and after 6CS, our President, then put on a very nice cray fish supper, 807, served by 6ZCS, hi!

Jack 6BU has been at it again, and is now working the State 50 mc millibands using a transistorised rig with OC16s in the final and is receiving 5 x 8 over 300 miles; good on you, Jack. 6BU is also working the 100 mc. 6CW and 6AG are going to have a QRP net with 12Bs and Clem 6CV is putting out a very nice c.w. signal. It looks as though we are heading for a QRP field day here in VKS, which I think will be very good as field days are what we want to bring the Amateurs of VKS together.

Thanks go to Cole 6CJ for sending a telegram of congratulations, on behalf of the W.L.A. to Princess Margaret and Mr. Armstrong Jones on their marriage. We hope the reply which was received will be framed and placed in the State W.L.A. building when it has been erected. When 6AG saw the letter in the mail with all the red seals on it, he was too frightened to open it, so left it for the Council meeting.

Skipper 6WS, I am glad to say, has received permission to run up to 65 watts. He has ordered a Mosley 6000 and is trying to get very shortly. The Geloxx tx he is trying to get free of customs duty, which I think should be allowed, seeing it is for personal Amateur use and also seeing that Skipper has the disability of being blind. We hope you succeed, Skipper.

Dave 6WT was heard on 40 mc on Sunday, 5th June, after a long silence on this band. Dave has just re-built his rig in a 150w. tube, using a Geloxx with an 813 in the final. He is now building a rx using the Geloxx and a 6000, and a very powerful rig when it is finished and will be well worth looking at, at one of the general meetings. Even now many of the VKs are talking about it, and it's still not completed.

TASMANIA

Our congratulations are due to Pat Geeves, President of the S.W.I. Group, for gaining his full licence. His call sign is TUP. We hope to hear you over the air, Pat. Bob TTY has been to Sydney during May to take his father there to undergo an operation. We hope everything turns out for the best. Bill. Joe TBJ is now radiating very well on the megacycle band, namely Channel 2. I understand that the monster t.v.i. has reared its ugly head in a couple of cases, so get up to it chaps and clear things up before the R.D. Contest arrives. We were all delighted to meet Poley TCK, who dropped in to our June meeting.

The DX net on 21 June was Y1P1 on phone, and VP5VB with ZLIAV on the key, both on 14 megs.

Our June meeting took the form of an auction of surplus equipment, and we were certainly masses of it for sale. Unfortunately, it was the day before pay day for me, hi. Charlie VKS has been away, chaps, and bottle water at his QTH the month, with his XYL and children suffering with chicken pox. We hope that all is well again Charlie, and that Lois has taken a course of domesticity again. Jack TJB has his daughter Jennifer in hospital recovering after the removal of her appendix on 1st June. All is going well, I believe.

Rupe TRM, I learn, has recently retired from the servicing job he had, which took him around the State on regular trips. He now stands he has a part-time job with a t.v. outfit. It was good to hear you again on the 7 meg. band, the 100 mc. millibands. Rupe has taken the allocation of the R.D. licence from 1840 to 1880 Kc. for the use of the emergency network, the problem arises as to equipment, the view of the fact that most portable disposals equipment operates from 2 megs. only. However, it is a good thing, in my opinion, that W.L.A. has recognised the need for emergency operation. I have not as yet heard any activity on the channel.

NORTH WESTERN ZONE

Well here I am once again with my regretted absence from the last issue. The time is past midnight, yours truly having just arrived home from the W.L.A. While present, the meeting for this issue must reach our worthy editor

some time this day, here we sit to report. Just what will I report.

The first of the said meeting was down, only sixteen bucks showing up. As I've said before, chaps, please make an effort, at least for the August meeting which will be our Annual Meeting once again. Your moral support is badly needed as we have suffered severe losses to other zones in recent months and there is work started long ago to be finished.

I visited VK3 land in May; now there's a place. It rained for fifteen days out of the month, but we were able to know the territory, just get in touch with Ron 30M. He knows all the back country roads and shortcuts that take twice as long. Never mind, Ron, it's something to look back on. We visited and stayed a couple of days with Arthur 3AUL and his mother at Smoko. You should have seen us stoking up rx to have a have. Also passed the time of day with Arch 3BW, John 3AMC, Bill 3BU, Ron 30M; found Ken 3CW absent in Fiji (one way to get DX). Had dinner and spent a very pleasant evening with George 3AHN, his XYL and family which included John 3AAA. We also found time to look at the concrete knowledge of the W.L.A. and took the hammocks to the museum and the zoo. Now it's back to try and get the new tx going.

The new radio units for the Burnie Fire Brigade should be well on the way to completion by the time this appears in print. I think a working bee is planned for the next social meeting, chaps, so persuade a soldering iron to be brought along.

Gee! I almost forgot the most important bit of all; associate David Walden is no longer an associate. You've guessed it, in one, he has his full ticket. Our congratulations David and we are looking forward to welcoming you on the bands—perhaps 20 mx for a start.

HAMADS

1/- per line, minimum 3/-.

Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received by 28th of the month and remains in force for one advertisement. Calculation of cost is based on an average of six words a line. Call signs are charged at 10 words. All other advertisements not accepted in this column.

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SELL: Electronic Flash, Mecabell 500. professional model, output 30/120 joules, provision for ext. flashgun, as new, cost £53. Best offer. Sabin, Fishbourne Rd., North Manly, N.S.W.

SELL: SX28 Receiver, one owner, wonderful performer, good condition, £100. VK4FJ, 76 Newman Ave., Camp Hill, Brisbane.

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HEATHKIT TX-1

"APACHE" HAM XMITTER KIT

Emphasising high quality, this rig operates with a 150 watt phone input and 180 watt c.w. input. In addition to c.w. and phone operation, built-in switch selected circuitry provides for single sideband transmission through the use of a plug-in external adaptor. A completely re-designed and stable v.f.o. provides low drift frequency control necessary for s.s.b. transmission. A slide-rule type illuminated rotating v.f.o. dial with full gear drive vernier tuning provides ample bandwidth and precise frequency settings. The band switch allows quick selection of the Amateur bands on 80, 40, 20, 15 and 10 metres - 11 metres with crystal control. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL24 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in c.w. operation. Final amplifier is completely shielded for greater t.v.i. protection and transmitter stability.

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★

The WARBURTON FRANKI Page



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HEATHKIT RX-1

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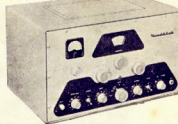
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HEATHKIT SB-10, SINGLE SIDE-BAND ADAPTOR KIT

The many advantages of single sideband transmission will be of interest to Hams now operating strictly a.m. or c.w. S.s.b. requires less spectrum space, interference and fading are reduced, and signal strength is increased without greater power output. Designed as a compatible plug-in adaptor for the TX-1, it can also be used with transmitters similar to the DX-100 or DX-100B by making a few simple circuit modifications while still retaining the normal a.m. and c.w. functions. This modification will also be available soon in kit form. Extremely simple to operate and tune, the adaptor employs the phasing method of generating a single sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled & wired in sealed plug-in unit.

Price: £98/8/- plus S.T.



HEATHKIT DX-100B TRANSMITTER KIT

The model DX-100B is a completely bandswitching rig for phone or c.w. operation on 160, 80, 40, 20, 15, 11 and 10 metres. It has a built-in v.f.o. or may be excited from crystals. Crystal sockets are built in. The easy-to-build kit contains all parts necessary for construction, including tubes, cabinet, hardware, etc. The detailed step-by-step instruction manual features plenty of pictorial diagrams for easy assembly. Pi net work output coupling allows matching non-inductive loads from 50 to 600 ohms, and is only one of the design features of the outstanding performer. Assembly is subdivided into several stages. This allows the construction to proceed smoothly from one section of the transmitter to another. Sub-units are assembled and then added to the complete chassis. The chassis is extra strong 16 gauge copper-plated steel. Construction is further simplified by use of a pre-formed wiring harness, pre-formed coils, etc.

Price: £174 plus S.T.

★



HEATHKIT AR-3

ALL-BAND RECEIVER KIT

The Heathkit model AR-3 receiver features proven circuit design and physical layout. The net result is good sensitivity and selectivity, coupled with more flexible overall operation. Performance of the AR-3 is really outstanding, especially in view of its low kit price. High Q slug-tuned coils are used in the front-end and an antenna trimmer has been added so that the front-end may be peaked to a particular signal on any of the bands. The coil layout permits easy alignment from above the chassis. Predesigned oscillator coils result in increased conversion transconductance through the mixer circuit, and new-type i.f. transformers allow a better band pass curve, and more gain. The tuning capacitors are shock mounted, and the overall layout eliminates ground loops, shortens important lead lengths, and makes for easy assembly.

Price: £31/4/1 plus S.T.



WARBURTON FRANKI

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Six H.F. Bands—80 to 10 Metres

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★ Amateur Nett Price: £163/1/10 (F.O.R.)
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